The Farm

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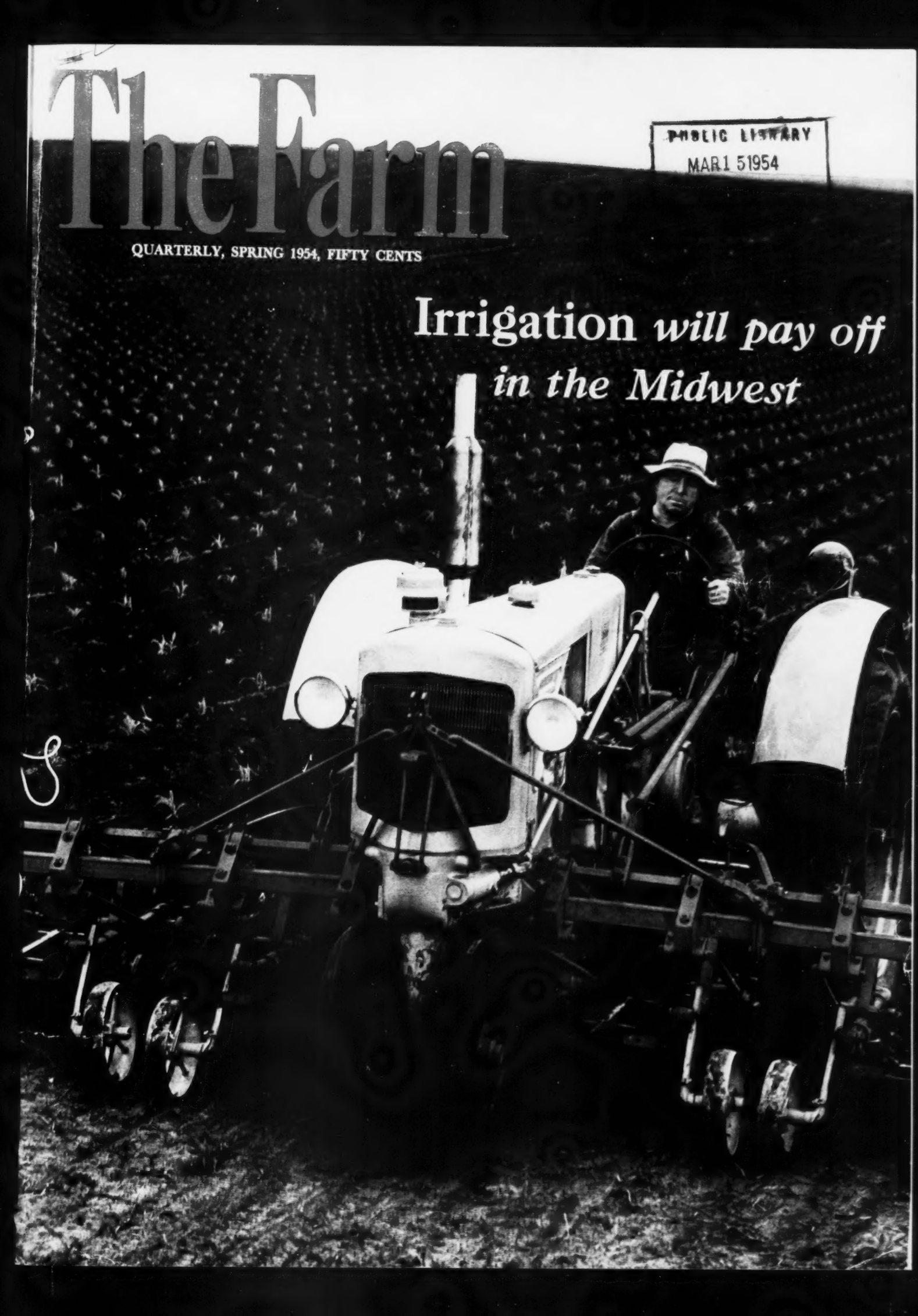
QUARTERLY, SPRING 1954, FIFTY CENTS

Irrigation *will pay off in the Midwest*



Only these **STRAIGHT** *lugs with "wedge-in" Action give "The Greatest Pull on Earth!"*

Goodyear's STRAIGHT-LUG SUPER-SURE-GRIP is widely imitated—but a close look will show you where imitators fall down:

SUPER-SURE-GRIP'S RULER-STRAIGHT LUGS come closer together at shoulders, take "wedge-in" bites that *firm* loose soil—give "the greatest pull on earth!"

O-P-E-N C-E-N-T-E-R, helps *straight* lugs bite deeper, pull better!

LONG EVEN WEAR—for *straight* lugs work evenly against soil, roll smoothly on road—and so *wear evenly,* last longer!

RE-LUGGING SAVINGS—for SUPER-SURE-GRIP'S vastly greater body strength keeps it *fit* to re-lug or retread—saves replacement!

When these four Goodyear features start working for you, saving time and money at every turn, you'll know why *more farmers surveyed prefer SUPER-SURE-GRIPS than the next 2 makes put together!* Why not talk things over with your helpful Goodyear dealer? Goodyear, Farm Tire Dept., Akron 16, Ohio.

Super-Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

FIRST in Traction • FIRST in Long Wear • FIRST in Popularity

GOODYEAR

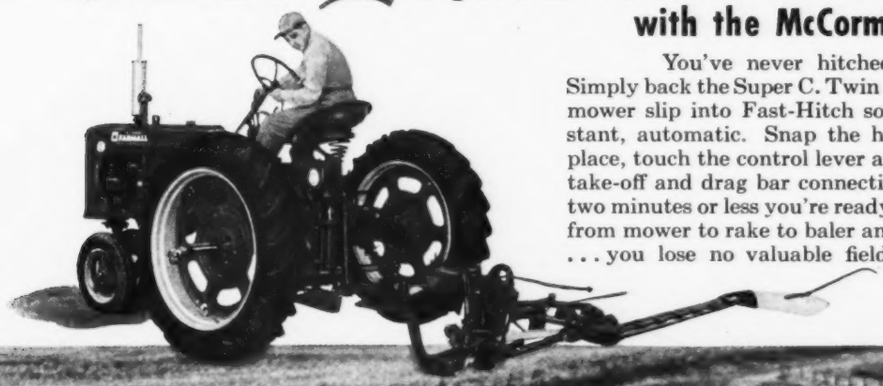
Super-Sure-Grip Tractor Tires

THERE'S A SPECIALLY DESIGNED GOODYEAR TIRE FOR EACH VEHICLE ON THE FARM

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Quick as a Click... you *Fast-Hitch* and *MOW*

with the McCormick® FARMALL® SUPER C



You've never hitched a mower so easily . . . so *fast!* Simply back the Super C. Twin coupling beams on the McCormick mower slip into Fast-Hitch sockets and *click* . . . hitching is instant, automatic. Snap the hydraulic Touch-Control link into place, touch the control lever and raise the mower for easy power take-off and drag bar connections . . . no tugging, no lifting! In two minutes or less you're ready to mow 35 acres a day. Or, switch from mower to rake to baler and back again, as often as you wish . . . you lose no valuable field time with Farmall Fast-Hitch!

. . . then *Fast-Hitch* and *Bale* up to 10 tons an hour with new McCormick 55

Slip the Fast-Hitch drawbar into place, then lower it hydraulically for no-lift hitching the Farmall Super C to either the twine or wire-tying, engine-driven McCormick No. 55. In seconds it's ready to start kicking out big, tight-packed 15 x 19-inch bales that haul and stack to beat any you've ever made—with a record for non-stop, non-miss tonnage never before equalled by any baler on the market.

Prove to yourself that you can save valuable hours at haying time with Farmall Super C Fast-Hitch and big-capacity McCormick hay machines. Be ready to Fast-Hitch and *GO* when hay is ready to cut! See your IH dealer for a demonstration *NOW!*

INTERNATIONAL HARVESTER

International Harvester products pay for themselves in use—McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Crawler Tractors and Power Units . . . Refrigerators and Freezers—General Office, Chicago 1, Illinois.

NEW catalogs . . . Write TODAY!

INTERNATIONAL HARVESTER COMPANY
P. O. Box 7333, Dept. FQ-3, Chicago 80, Illinois

Please send me your new catalogs as checked below:

☐ Farmall Super C Fast-Hitch ☐ No. 55 engine-drive baler
☐ No. 5 side delivery rake ☐ No. 45 PTO-drive baler

Name_____

Address_____

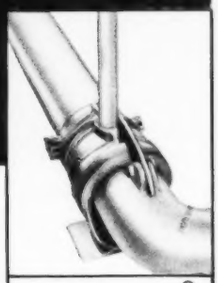
Post Office_____ State_____

I farm_____ acres. Principal crops_____

My IH Dealer is_____

There are REAL REASONS why SHUR-RANE® is better!

- the most soundly engineered system in the world —*specially designed and installed for your own soil, crops, land slope, weather, for your own water supply and labor conditions.*
- backed by a national organization that is technically and financially able to *guaranty* satisfactory performance.
- a SHUR-RANE system will never be an orphan — you can always be sure of service, parts and additions.
- a large staff of field engineers backs up your well-trained SHUR-RANE dealer in solving your individual irrigation problems.
- continuous improvements enable you to keep your SHUR-RANE system up-to-the-minute at all times and at lowest cost to you.



SHUR-RANE®

PORTABLE SPRINKLER IRRIGATION

FOR SURE PROFITS!

The most important guaranty of getting a profitable, dependable and easily financed portable sprinkler irrigation system is THE REPUTATION AND ABILITIES OF THE MANUFACTURER AND HIS DEALERS. Each SHUR-RANE installation is backed by the entire resources and research facilities of Food Machinery and Chemical Corporation, the nation's leading manufacturer of irrigation equipment. Why gamble? Be sure with SHUR-RANE.

NEW! See ad describing new SHUR-RANE wheel type sprinkler systems, SHUR-ROLL on Page 149.

SHUR-RANE®
custom-engineered to your own farm
INSURES:

- Larger Yields
- Better Quality Yields
- Faster Seed Germination
- Water Conservation
- Better Fertilizing
- Drought Insurance
- Soil Conservation
- Labor and Time Saving

Partial view of the complete up-to-date engineering department maintained by SHUR-RANE.

Send for **FREE** *booklet today*

SHUR-RANE IRRIGATION SYSTEMS, DEPT. FQ-SP4
Food Machinery and Chemical Corporation
P. O. Box 145 • San Jose 1, California
If in one of the 14 Southeastern States, send to Florida Division, Lakeland, Fla.

fmc TRADE MARK

Gentlemen: Please send me my free copy of "What you should know about Portable Sprinkler Irrigation."

NAME_____

ADDRESS_____

CITY_____ STATE_____

Farm Quarterly, Vol. Nine, No. One. Editorial, Circulation and Executive Offices, 22 East 12th Street, Cincinnati, Ohio. Published quarterly by the Automobile Digest Publishing Corp.,
Copyright 1954.
Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Add $1.00 per year extra for rates outside the U.S., Canada,
Entered as second class matter at the Post Office, Cincinnati, Ohio, under the Act of March 3, 1879. (Title Reg. U.S. Pat. Off.)

New Idea 120 bu., PTO spreader. 4 rates of feed for each forward gear of your tractor. Works under greater variety of field conditions.

How to get the most for your money

To farm profitably today, every dollar you invest in equipment has to produce income like it never did before. For instance, suppose you are thinking about buying a manure spreader.

There are several reasons why a NEW IDEA gives you more value per dollar you invest. NEW IDEA built the first "widespread" manure spreader. NEW IDEA has built and sold more spreaders for more years than any other company. It's one of NEW IDEA's main products, not just a sideline. NEW IDEA spreaders are the result of experience that only NEW IDEA has — experience that comes from building and selling over a half million spreaders; changing, improving, perfecting year after year.

You can choose from 4 models: the big No. 15 PTO shown above; or a ground-driven, 2-wheel, 90-bushel model; or a 2-wheel, 65-bushel model; or a 4-wheel, tractor or horse-drawn, 75-bushel model.

Get the most for your money. Look at others, then go to your NEW IDEA dealer and compare point for point. You'll see why it's such a *good* idea to buy a NEW IDEA manure spreader.

Fertilizer Spreaders — The newest member of the famous New Idea line. They're so good you get this ironclad guarantee: "The New Idea Fertilizer Spreader will spread fertilizer in ANY condition in ANY* amount, uniformly and accurately without clogging or your money back." Choose from 5 models: 12-ft., 10-ft., 8-ft., 6-ft., 5-ft.; plus tractor-mounted side-dresser for Ford or Ferguson tractors. Also a grass seeder attachment. *(*from 10 to 5000 lbs. per acre)*

SPECIFICATIONS (No. 15 PTO 120 bu. spreader)

BOX — select, corrosion-resistant pine, double riveted to steel frame, topped by steel flares; **FRAME** — heavy gauge angle steel; **DRIVE GEARS** — completely enclosed in oil bath; **BEARINGS** — centrally loaded, self-aligning, with renewable bushings; tapered roller bearings in wheel hubs; **PADDLES** — heavy duty, individually replaceable; **CYLINDERS** — heavy steel with 116 staggered high carbon steel teeth; **OPERATING PARTS** — fully shielded for longer life and safety.

NEW IDEA FARM EQUIPMENT COMPANY AVCO

DEPT. 1100, COLDWATER, OHIO

Please send free literature as checked:

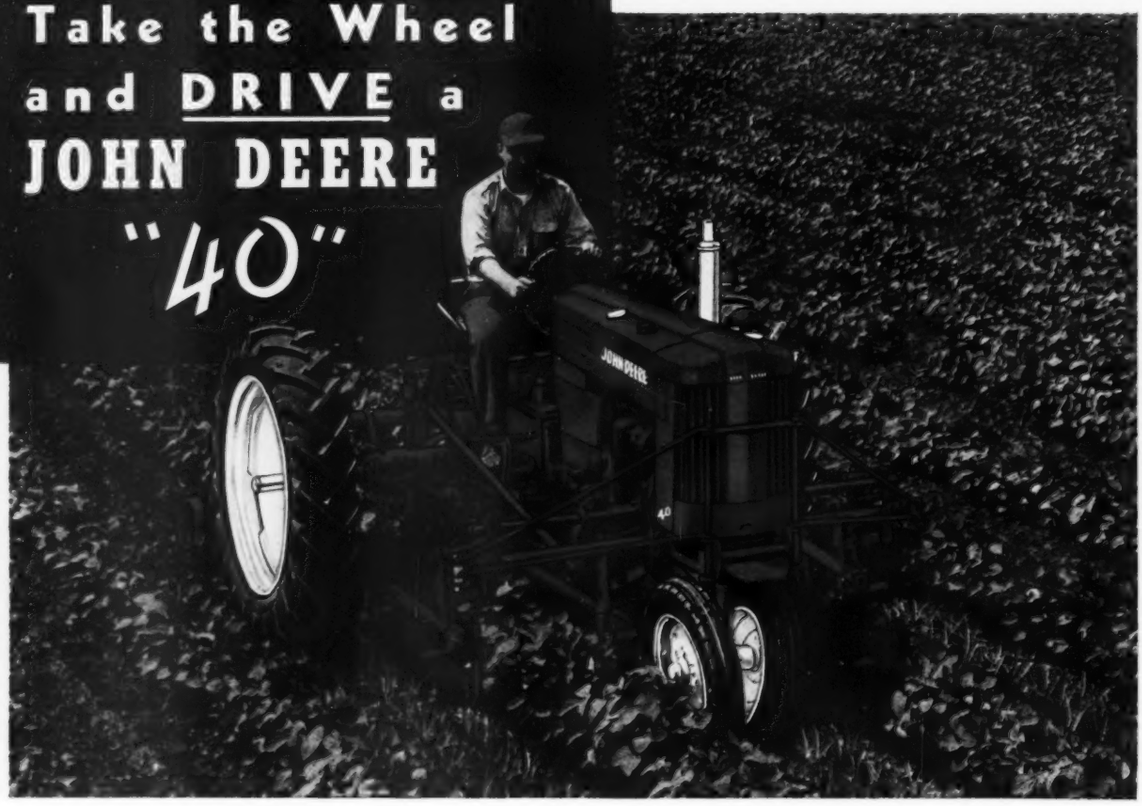
- ☐ No. 15 PTO Spreader (120-bu.)
- ☐ No. 12-A Spreader (90 bu.)
- ☐ No. 14-A Spreader (65-bu.)
- ☐ No. 10-A Spreader (4-wheel—75-bu.)
- ☐ Fertilizer Spreaders
- ☐ Need for Schoolwork
- ☐ I farm_____acres

NAME_____

ADDRESS_____

COUNTY_____ STATE_____

Take the Wheel and DRIVE a JOHN DEERE "40"



WHAT a tractor! What equipment! That's what you'll say when you do all your farming jobs with one of these modern two-plow John Deeres that's so easy to handle . . . so easy on you and your pocketbook.

Best way to get the complete story is to *take the wheel and drive* . . . experience the easy steering . . . the unexcelled view when cultivating . . . the four forward speeds . . . the ease of changing tools on the 3-point hitch . . . the extra comfort provided for the operator, sitting or standing . . . the exclusive Load-and-Depth Control . . . the quick, effective action of the independent, self-energizing brakes . . . and best of all, the time-proved Touch-o-matic hydraulic control of the Quik-Tatch working tools.

Remember — in choosing *your* new tractor, it's *performance* that counts . . . and that's where the "40" speaks for itself.

Remember, too, that when you choose a "40" for your working partner, you can get just the matched equipment you need at any time during the tractor's long life. The Quik-Tatch cultivator, shown above, is just one of more than forty integral, hydraulically controlled tools now being built for the "40".

NOT JUST ONE MODEL . . . You Can Choose the "40" that Fits Your Needs Exactly

TRICYCLE STANDARD UTILITY CRAWLER

JOHN DEERE
MOLINE ILLINOIS

ASK YOUR JOHN DEERE DEALER FOR A FREE DEMONSTRATION

Send for Free Literature

JOHN DEERE, Moline, Illinois
Dept. G54

Please send me free literature on the

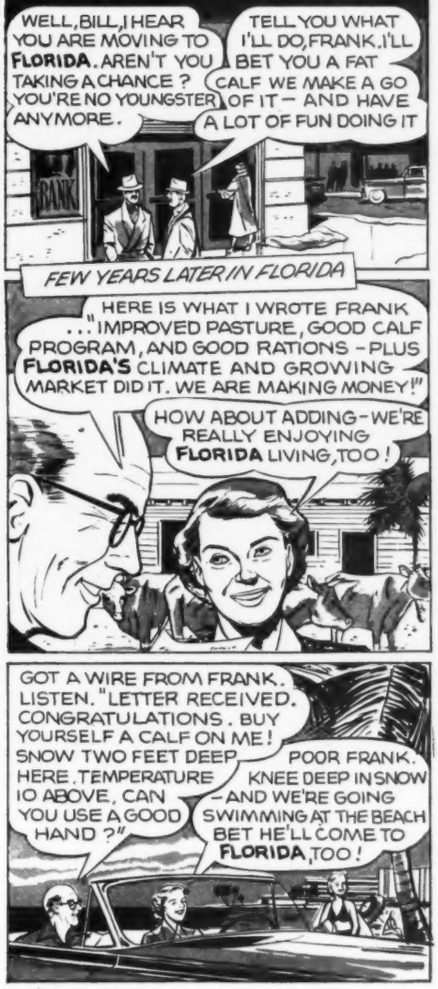
☐ "40" Tricycle ☐ "40" Standard
☐ "40" Utility ☐ "40" Crawler

Name .....

Rural Route No. ..... *Box* .....

Town ..... *State* .....

Farmer Wilson won his bet


WELL, BILL, I HEAR YOU ARE MOVING TO FLORIDA. AREN'T YOU TAKING A CHANCE? YOU'RE NO YOUNGSTER ANYMORE.
TELL YOU WHAT I'LL DO, FRANK. I'LL BET YOU A FAT CALF WE MAKE A GO OF IT — AND HAVE A LOT OF FUN DOING IT
BANK
FEW YEARS LATER IN FLORIDA
"HERE IS WHAT I WROTE FRANK ... IMPROVED PASTURE, GOOD CALF PROGRAM, AND GOOD RATIONS - PLUS FLORIDA'S CLIMATE AND GROWING MARKET DID IT. WE ARE MAKING MONEY!"
HOW ABOUT ADDING - WE'RE REALLY ENJOYING FLORIDA LIVING, TOO!
GOT A WIRE FROM FRANK. LISTEN. "LETTER RECEIVED. CONGRATULATIONS. BUY YOURSELF A CALF ON ME! SNOW TWO FEET DEEP HERE. TEMPERATURE 10 ABOVE. CAN YOU USE A GOOD HAND?"
POOR FRANK. KNEE DEEP IN SNOW - AND WE'RE GOING SWIMMING AT THE BEACH BET HE'LL COME TO FLORIDA, TOO!

Follow the lead of Farmer Wilson . . . combine profitable farming with happier living.

Fast-growing Florida, with its mild year 'round climate and other agricultural advantages, offers real opportunities to experienced dairymen, poultrymen, truck farmers, livestock raisers and nurserymen. Adequate capital is necessary, of course.

Get away from winter! Plan a Florida vacation now. Take time out from sightseeing and sunny fun to visit the farm areas and personally "look the ground over."

Meanwhile mail coupon for 36-page booklet filled with photographs and facts on agricultural opportunities in Florida.

FABULOUS Florida **WARM in Winter! • COOL in Summer!**

STATE OF FLORIDA
5310-E Commission Bldg., Tallahassee, Fla.
Please send me FREE copy of "Farm Opportunities in Florida."

Print NAME

Print ADDRESS or R.F.D. NO.

Print POST OFFICE (town) STATE

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THE FARM QUARTERLY
22 East Twelfth Street, Cincinnati 10, Ohio

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Farm Quarterly is published Spring, Summer, Autumn and Winter. Price 50c a copy; $2.00 a year, $3.50 two years, $5.00 three years. Add $1 per year for countries outside USA and Canada. Send check to Farm Quarterly, 22 East 12th Street, Cincinnati 10, Ohio.

Constant research gives your veterinarian new and better drugs

...to help protect your livestock's health

NEW SIGNS GOING UP
Many of the approximately 900 new veterinarians, who graduate this spring, will soon be putting up their signs . . . ready to serve you in bringing better health to your livestock.

Never before has your veterinarian had such highly effective drugs with which to fight disease in your herds.

But the search for newer and better treatments never ceases.

At veterinary colleges and experiment stations . . . and also at the Squibb laboratories in New Brunswick, N. J. . . . extensive research is constantly carried on.

Highly-skilled Squibb scientists – using latest and most exacting techniques known to science – continually seek new and improved veterinary drugs, new applications of older ones.

Trained technicians, too, constantly seek improved ways of producing Squibb veterinary products . . . to assure highest uniformity, purity, and efficacy.

Your veterinarian . . . through his professional associations, and veterinary journals . . . keeps abreast of latest approved techniques and drugs – including Squibb drugs.

He brings to your farm – on call – full benefits of modern scientific research *to back up your management practices* in guarding your livestock's health, and your investment.

SQUIBB
Veterinary Department
745 Fifth Avenue, New York 22, N. Y.

For prompt accurate diagnosis, always consult your veterinarian.

SQUIBB – A NAME YOU CAN TRUST

Give your Piggies a boost...

Seagram Solubles give piggies a *nutritional boost* that hurries them to market finish in quick time!

Low fibre, readily digestible proteins, and water soluble vitamins which seem to "hang on" and help the pig, even after he goes on short diets, are the nourishing values which make Seagram Solubles such an outstanding feed supplement.

By supplying these all important growth factors to the feed industry, Seagram Solubles step up feed efficiency and permit farmers to feed less, produce more, and give their *profits* a sizable boost too! *Carload lot inquiries are invited.*

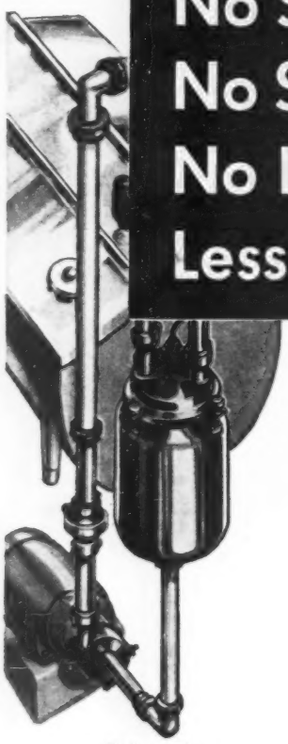
JOSEPH E. SEAGRAM & SONS, INC.
Louisville 1, Kentucky
Grain Products Division

Seagram
SERVICE TO AGRICULTURE

THE *Surge* SIPHON

it takes less muscle— It takes less time

No Stooping!
No Squatting!
No Lifting!
Less Walking!



The cows come to you and you milk standing up. The Surge Siphon takes the milk from the end of the cow's teat and delivers it to where you want it to go through pipes of glass or stainless steel.

Instantly adjustable downward and forward Surge TUG & PULL that holds the teat cups down so that they don't crawl up and shut off the flow of milk.

Surely this is the very easiest and fastest way to milk cows that anybody ever saw... and... you have a clear view of the milk. You can see exactly what the cow is doing.

Your Surge Service Dealer can tell you and show you more.

BABSON BROS. CO.
2843 W. 19th ST.
CHICAGO 23, ILL.

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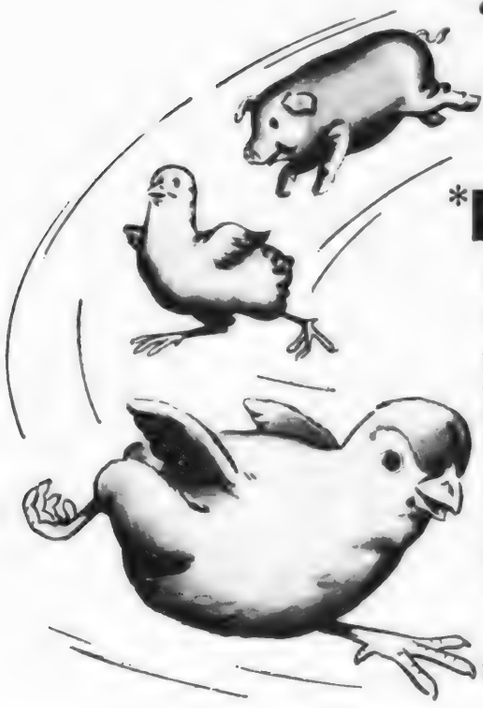
ATLANTA • HOUSTON • KANSAS CITY • MINNEAPOLIS • SACRAMENTO • SEATTLE • SYRACUSE • TORONTO

NEW WAYNE "PE"* PUTS 'EM...

Out In Front

IN EVERY WAY



*PRODUCTIVE EFFICIENCY

For Safe, Strong Starts • Fast, Steady Growth • Early Maturity • More Gain Per Bag

Now...Wayne "PE"...an intricate blend of feed values designed to provide your birds or young stock with all the growing and producing power they can use.

Backed by over 50 years of feed making experience, Wayne "PE" brings you the latest developments in modern-day nutrition...including the judicious use of antibiotics, high energy formulas, arsonic compounds, and other recent developments.

This Spring...put your young stock "out in front" in every way. See your Wayne Dealer today.

ALLIED MILLS, INC.

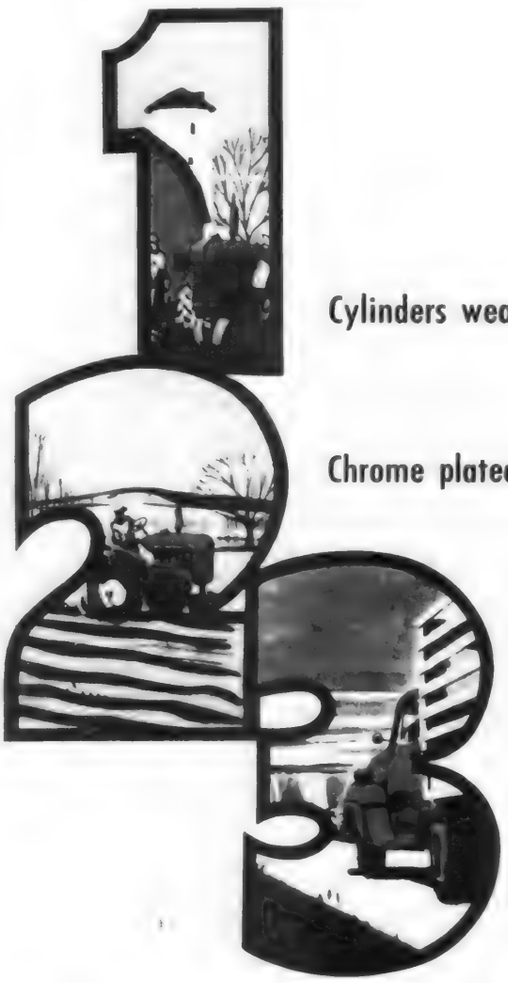
Builders of Tomorrow's Feeds...Today!

Executive Offices: Chicago 4, Ill. • Service Offices: Ft. Wayne 1, Ind.

WAYNE "HIGH ENERGY" STARTING FEEDS

CHICK STARTER • ROCKET BROILER • TAIL CURLER • TURKEY STARTER • CALF STARTER • CALFNIP Milk Replacer

a syllogism* for farmers...



Cylinders wear most at the TOP

Chrome plated rings retard wear

Thus, TOP rings must be chrome plated to retard cylinder wear!

If you want the *full* benefit of chrome piston rings in your car, truck, or tractor, remember this—**no so-called "chrome" set is complete unless it offers the protection of chrome where most wear occurs . . . on the TOP ring rather than the oil ring alone!**

That's why Perfect Circle's 2-in-1 chrome ring set has *both* top and bottom rings plated with thick, solid chrome. And the pay-off? It's thousands and thousands of extra hours of top performance, even under the most severe kinds of farm service!

For new engine life, sustained power and oil economy—with no tedious break-in period—install Perfect Circle's 2-in-1 Set on your next re-ring job! Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., Toronto, Ont.

* **Deductive reasoning!**

Solid chrome plating on top and bottom rings gives wear protection throughout entire area of ring travel. Only 2-in-1 furnishes alternate HiPressure spring with every oil ring, for badly worn engines.

Perfect Circle

2 in 1 chrome piston rings

The standard of comparison

LETTERS

Are Possums Delicious?

Sirs:

I enjoyed your article on possums. I suggest that there is a chance that the part about possum being preferred to ham and eggs is like the story about their mating through the nose, just folklore. My efforts to find someone who likes possum has resulted in the usual run around. It goes like this, "Well, no, I don't care for it, but now I heard that Smith. . . ." and when you get to Smith his answer is, "Well, not me, but they say that Jones. . . ." and so on and on you go.

J. Lamont Norwood
Pittsboro, North Carolina

English Can Be Fun

Sirs:

Jave hai not received he primero humber de The Farm, strange by el time pass from of amiable card aunounce it Supscription by three years por charge de Mr. R. Enriquez.

Mi gratefulness, se mek remit have interest yea caprice y me molesta su deviation.

Pardon si no explain clear yet, no write Englissh.

Mariano Alegria
Puebla de Brollon, Lugo, Spain

Nos remit el periodico to Senor Alegria as soon as puede. Oh, pshaw! We can't speak Spanish either, but he's getting the magazine now.

Right Picture, Wrong Photographer

Sirs:

On Page 38 of the Winter issue, you credited to me the fine photograph of the steer licking molasses. I wish I had taken that shot; but it

Portrait by Dave Strout

was made by my former partner, Dave Strout, while we were on assignment together at the Roswell Garst farm near Coon Rapids, Iowa. Dave used a Leica camera with a 135mm Hektor lens to put the steer right in the reader's lap.

Joe Munroe

Our apologies to Dave Strout for mislabeling his fine photograph and our thanks to Joe Munroe for noting this error.

(*Continued on page* 144)

"We need an EATON 2-Speed Axle on our Hills"

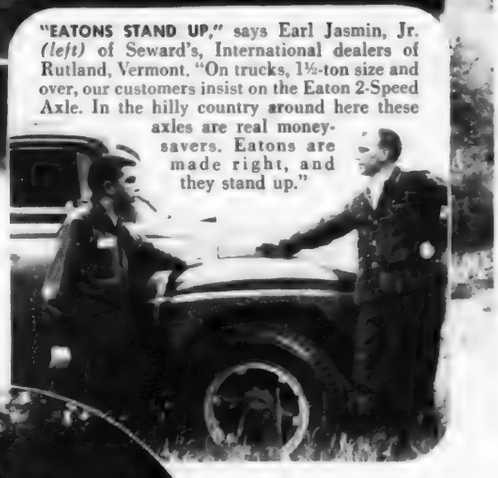
...says W. B. Thomas, Vermont dairy farmer

"WE HAVE some real hills in this country, and a farm truck has to be a real climber," says dairy farmer W. B. Thomas of Rutland, Vermont.

"That's one of the reasons why we specified an Eaton on our International. With the Eaton 2-Speed Axle we easily climb steep grades—even in the fields, with a full load. The low-gear range of the Eaton Axle gives us the extra pulling power we need, regardless of grade or ground conditions. We can match the slow speed of an ensilage cutter in the fields and come out with full loads. There's no fear of bogging down.

"We make many highway runs carrying cattle. The high gears of the Eaton Axle save gas and a lot of hours – we make better road speeds with lower engine r.p.m. The Eaton 2-Speed Axle gives a farm truck longer life and cuts maintenance costs."

Your truck dealer can show you how an Eaton Axle can save you trucking dollars. Ask him for a demonstration.



"EATONS STAND UP," says Earl Jasmin, Jr. *(left)* of Seward's, International dealers of Rutland, Vermont. "On trucks, 1½-ton size and over, our customers insist on the Eaton 2-Speed Axle. In the hilly country around here these axles are real money-savers. Eatons are made right, and they stand up."

OFTEN A PRIZE PASSENGER of Mr. Thomas' Eaton-equipped International is this prize-winning registered Holstein bull. "When hauling valuable cattle, the Eaton 2-Speed Axle helps prevent falls and bruises. We can make softer, smoother starts and get over rough spots without throwing animals off their feet."

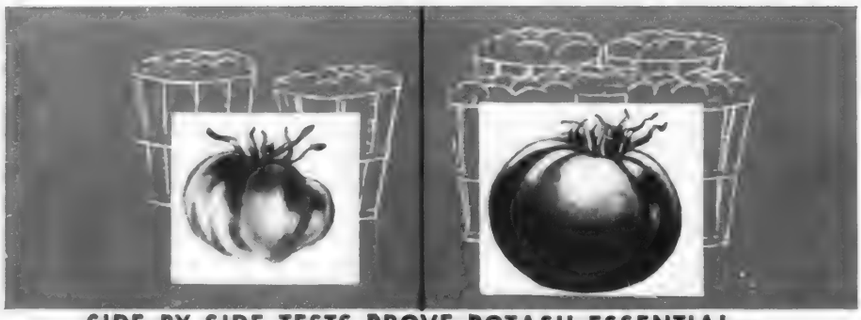
MORE THAN 2 MILLION EATON AXLES IN TRUCKS TODAY

EATON 2-SPEED *Truck* AXLES

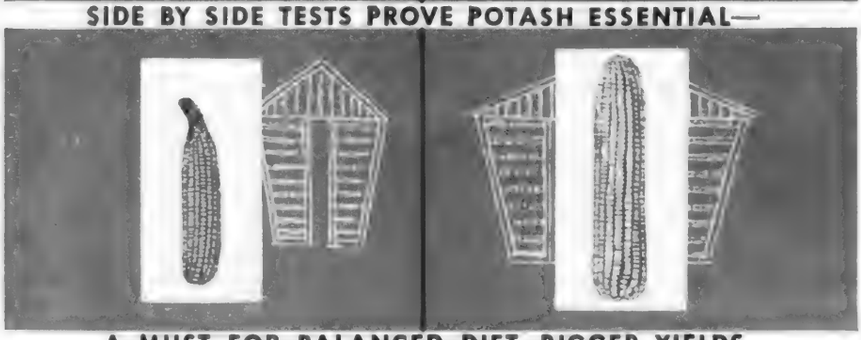
EATON MANUFACTURING COMPANY, CLEVELAND, OHIO

PAR

PROJECT ADEQUATE ROADS: Crowded highways add to your cost of marketing farm products. Join the crusade for more and better roads essential to prosperity and progress.



SIDE BY SIDE TESTS PROVE POTASH ESSENTIAL—



A MUST FOR BALANCED DIET, BIGGER YIELDS

NOW, MORE THAN EVER

POTASH

makes a difference to you

Your Profit Picture. In a period of rising costs, *more efficient* use of land, labor and machinery is a *must*. Producing more for less is the key to present and future profits. That's why Potash is so essential. Used liberally, Potash LOWERS YOUR UNIT COSTS OF PRODUCTION, *saves* on labor, helps you earn *higher* profits per acre.

Your Yield Story. Even with Potash consumption tripling in the past ten years, farm experts still say *not enough* is being used. More Potash is needed if present yields are to be *increased* or even *maintained*. Be sure you consult your agricultural adviser for correct amounts for your land. But remember, *more Potash means more profits*.

Send for Free Booklet. Plant Food Utilization Booklet shows how your crops remove valuable plant foods from the soil . . . helps you better understand your fertilizer needs. For your copy, write to address below.

KO *Symbol for bigger yields . . . bigger profits*

AMERICAN POTASH INSTITUTE, INC.

Dept. G-25, 1102 Sixteenth Street, N. W., Washington 6, D. C.

MEMBER COMPANIES: American Potash & Chemical Corporation • Duval Sulphur & Potash Company
Potash Company of America • Southwest Potash Corporation • United States Potash Company

Over The Back Fence

Black Cow Fly Trap It's amazing how ingenious a man can be when it comes to getting out of work. There's Mr. D. M. Causey, of Pickens County, S. C., who owns a fine herd of 100 Hereford brood cows. He also owns a few black cows, which he runs with his Herefords. The black cows are his fly catchers. Mr. Causey explains that he has observed that flies prefer a black cow. In fact, he says, even on a Holstein flies congregate on the black spots, shunning the white areas. Mr. Causey sprays his black cows only, cutting down considerably on work and the cost of spray. It doesn't take very long for all the flies around the herd to rotate to the black cows, where they are done in. Mr. Causey figures that he saves about a hundred dollars a year and a lot of time.

How Now White Bear You don't see very many polar bear heads in the trophy rooms and this has always given us a quiet satisfaction. Here is one noble animal, we thought, which is comparatively safe from the civilized white savage who likes to collect heads. The reason for this is that it's cold where he lives, and you can't go after him in a jeep. But apparently the polar bear is safe no longer. The Norwegian National Travel office now announces an "Arctic Safari," conducted by one Odd Berg, who implies that you are practically certain of bagging at least one polar bear, and as many walrus and seal as the law allows. For $1,170 Mr. Berg will pick you up in Oslo, take you on a comfortable Diesel-powered craft to Spitzenborgen, and guide you around until you have made your kill. Guns and everything are furnished and you'll be gone about 30 days. There will be seven Artic safaris this summer and we hope the polar bears hear of this in time.

Slow Motion In the Pig Sty Why the Russians are not eating high on the hog these days might be explained by the quaint notion they have of efficiency in the hog pen. What U.S.A. hog grower would put up with the labor problem posed by this release from the Soviet Information Bureau?

"The most notable achievement of the hog breeders is their method of feeding the swine. One farmer handles the feeding of a hundred pigs. Formerly, when there were less than 300 hogs on the ranch, it took 23 persons to look after them. Nowadays, the 800 hogs on the ranch are looked after by only 16 persons."

(*Continued on page* 139)

A NEW tractor

Massey-Harris carburetors are precision designed and adjusted to individual engines. Assures correct mixture at all speeds.

Free-flowing, long throat manifold means fast, uniform vaporization . . . quick fuel delivery . . . equal charge to each cylinder.

Massey-Harris transmission gears have a positive full-rolling contact. They're cut to tolerances of less than a 1/1000 part of an inch.

Cyclo-Head combustion spins and swirls the burning fuel . . . gives it a cyclonic turbulence for the full length of the piston stroke.

Longer piston stroke means greater power leverage . . . more "torque reserve" . . . more lugging power at low engine r.p.m.

with a lot of NEW ideas!

BIGGER...MORE POWERFUL MASSEY-HARRIS "44" Special

45.85 max. drawbar h. p., 50.29 on the belt

WALK around the new "44" Special. Check each side . . . the rear . . . up front — every angle. Climb up on the seat. Get the feel of the wheel. Set your feet on the pedals that are so easy and comfortable to operate.

Start the engine! At once you feel the eagerness . . . sense the greater power . . . in the willingness, the smoothness that says let's go to work.

It's the performance of an all new tractor! Exciting in every feature — the most powerful 3-4 plow row-crop tractor you can get for your farm.

A bigger 277 cubic inch gasoline engine with removable wet sleeves, exhaust valve rotators, greater power leverage in long stroke pistons. A new firing principle — Cyclo-Head combustion — that spins and swirls fuel in a twisting turbulence the full length of the piston stroke.

It's power that heavy loads don't pull down . . . "torque" reserve that's more than a claim. And the "44" Special does it at a low 1350 r.p.m. for longer engine life, lower maintenance.

Now look around a bit more. The "44" Special is huskier — with heavy cast wheels, bigger tires, better weight balance. Here's real comfort. A clear, unobstructed platform — no braces — no "in-the-way" controls. Everything easy to reach, easy to operate. Wider spaced pedals. A follow-up hydraulic system with a host of adaptations — powered 2-ways. A live-power take-off. Ball-bearing eased steering that takes the strain off arms and shoulders.

There's more. You can see and try every feature of the new "44" Special at your Massey-Harris dealer's. Drive one — compare it. Once you do, you'll never be happy until you own one.

For Folder; write The Massey-Harris Co., Inc., Dept. C-222, Racine, Wis.

Make it a Massey-Harris

Parts and Service through more than 2500 authorized dealers

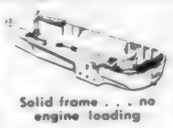
Big 277 cubic inch engine, wet sleeves, 1350 r.p.m.

Highly flexible, adaptable hydraulic system

Heavy-duty clutch . . . 9 pressure springs

Bigger tires front and rear . . . cast wheels

Velvet Ride Seat . . . cushioned comfort, clear platform



Solid frame . . . no engine loading

Give your birds "teeth"

to grind their feed! Get faster growth . . . Cut feeding costs

WITH

STONEMO GRANITE GRIT

Your birds need "teeth" to help them make better use of their feed . . . grow faster . . . reduce your feeding costs! Give them insoluble STONEMO Granite Grit.

HELPS SPEED GROWTH – STONEMO's extra grinding surfaces help grind feed extra fine in the gizzard . . . crush grains and grasses . . . grind open many cellulose "capsules" in feed. This releases *more body-building nutrients* for faster growth and development.

HELPS SAVE FEED DOLLARS – STONEMO helps make your feed work harder . . . helps produce big, sturdy birds at less cost. You save money – step up profits!

GET STONEMO TODAY! – Put real "teeth" in your feeding program now. Get STONEMO Granite Grit in handy 10-lb. HOPPER-PAKS, or 25, 50 or 80-lb. economy bags. The easy-to-use HOPPER-PAK has trays to pull out to make a convenient hopper. It saves work – saves time! See your hatchery, feed or poultry supply dealer *today*.

STONE MOUNTAIN GRIT COMPANY, INC.

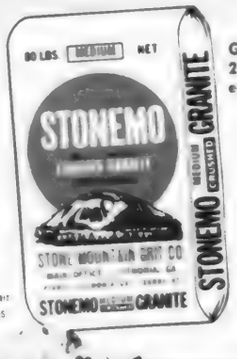
Executive Offices and Quarry: LITHONIA, GA.
Branch Quarry: BARRE, VERMONT

FOLLOW THESE 3 STEPS TO GROW BIG, STURDY BIRDS!

FINE SIZE STONEMO — **First 2 days** – Feed fine chick grains and fine-size STONEMO. Mix 10 lbs. grain to 1 lb. grit. **3 days to 4 weeks** – Start feeding mash . . . give fine-size STONEMO in HOPPER-PAK, or hoppers.

MEDIUM SIZE STONEMO — **4 weeks to 8-10 weeks** – Gradually switch to medium-size STONEMO – then keep hoppers full.

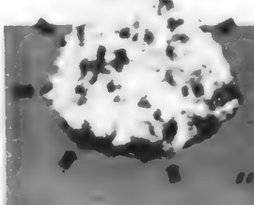
COARSE SIZE STONEMO — **8-10 weeks on** – Switch to coarse-size STONEMO. Then keep it before birds at all times . . . during growing period and in laying house.



MEDIUM SIZE STONEMO HARD GRIT MAGNIFIED 10 TIMES

Get STONEMO in 25, 50, or 80-lb. economy bags.

Also, get STONEMO in handy 10-lb. HOPPER-PAK.



STONEMO

the Grit with the "EXTRA GRINDING SURFACES"

Poultry Yard

Brooding With Lights Chicks have been raised in an icy refrigerator set at 10 degrees below zero with nothing to protect them from a quick freeze but an infra-red lamp. In Vermont and Minnesota, where they don't need a refrigerator to keep the air temperature down to below zero levels, farmers are duplicating this experiment on a practical basis with these heat lamps which warm the chicks, litter and equipment, but waste no energy warming the air. The radiant heat which comes from the infra-red lamp has the same heating quality as sunlight,

A CLUSTER of heat lamps broods the chicks and warms feed and water.

which passes through the layers of chill atmosphere above the earth without changing its temperature and yet warms the earth and any object it strikes.

There are several advantages in infra-red brooding which are attracting poultrymen all over the country. The initial cost of the brooding equipment is very low—just the lamps and light fixtures are all that is required, though some poultrymen use a hover, which increases brooding efficiency by 25 per cent, and a thermostat to cut operating costs. Costs are not great: a 250-watt lamp will brood from 60 to 100 chicks and consumes but a quarter of a kilowatt of electricity an hour; three to eight cents will cover the power cost per chick for the season. There is less piling up of chicks or poults under lamps and the farmer can see the whole flock any time without disturbing them by raising the hover. The lamps are normally suspended 18 inches above the chicks and lifted an inch a week as they mature, making it a simple matter to pull the lights up out of the way for cleaning. It is believed that infra-red brooding speeds up feathering.

Lamps come in 125, 250 and 375-watt sizes and in hard or soft glass bulbs. In figuring lamps per bird it is safe to rely on eight 250-watt lamps for 500 birds in severe winter weather and reduce this to five lamps for the same size flock in late spring. For brooding small batches of

(*Continued on page* 146)

NEW ...LOW-SEAT EAGLE HITCH CASE TRACTOR OPENS NEW WAYS

to Trim Time and Costs

★ **Low Bodyguard® seat** with torsional rubber springs for all-day comfort. Easy and quick to get on and off. Gives good visibility.

★ **Low platform.** Just a step from the ground, yet leaves full crop clearance for cultivating. Driver can sit or stand.

★ **Easy step-in to seat** ahead of fender. So handy, so convenient...No climbing over rear-mounted implements.

★ **Cultivate up-front** with "look ahead" cultivator—or behind with tools on Eagle Hitch. Adjustable tread, front and rear, for varied row spacing.

★ **One-minute hook-up** sitting down. Mount many Eagle Hitch implements without leaving tractor seat.

★ **Eager 2-plow power** from heavy-duty, high-torque engine with lugging ability for hard pulls at reduced speed.

NEW PIVOT-ACTION DISK

Eagle Hitch tandem disk harrow has pivot action from pull point in its own frame. Prevents side thrust when tractor turns, keeps gangs running true on contour curves. Entire harrow lifts clear for turning or transport at a touch of hydraulic control.

NEW PIVOT-ACTION PLOW

Pivots at proper point—in plow frame. Keeps all bottoms cutting full width on curves; also prevents side thrust. Breakaway safety release uncouples on striking stone, prevents damage. Two and 3-bottom sizes. For all Case Tractors with Eagle Hitch.

NEW Stability on steep slopes makes the Low-Seat tractor ideal for conservation tillage. Eagle Hitch Field Tiller uses variety of teeth, sweeps and shovels for pasture renovation and stubble-mulch tillage.

Handiest Tractor for 100 Jobs

No matter how many tractors you have tried . . . no matter what claims you have heard . . . you'll never know how handy a tractor can be until you take the wheel of this Case Low-Seater. Plowing, tilling, planting, haying, harvesting, hauling—you do every job a little better, change implements easier, drive with real comfort. The minutes you save count up into precious hours. The pennies you save on fuel and the dollars you save on upkeep count up into real money. Prove these facts in your own fields, around your own farmstead. See your Case dealer now—arrange for a personal demonstration.

Bigger Eagle Hitch tractors include the new 2-3 plow "SC" and "SC4," the Model "S," full 3-plow Models "DC," "DC4," and "D." There's a great new 5-plow Diesel, too.

MAIL FOR MORE ABOUT THE NEW THINGS

Mark here or write in margin any tractor or implement that interests you. J. I. Case Co., Dept. C-904, Racine, Wis.

Eagle Hitch Tractors— ☐ 2-plow Low-Seater ☐ New 2-3 plow "SC" ☐ 3-plow "D" Series ☐ Pivot-Action Plows ☐ Pivot-Action Disks

Name _____

Post Office _____

RFD_____ State _____

CLAY FULLY AUTOMATIC
BARN CLEANER

WE OFFER YOU THE ONLY CLEANER CHAIN ON THE MARKET THAT HAS A 10-YEAR GUARANTEE. YET COSTS ONLY $2.85 A FOOT WITH PADDLES. NO OTHER CHAIN GIVES YOU SUCH STRENGTH AND DURABILITY FOR SUCH LOW COST.

Jos. B. Clay
PRESIDENT
CLAY EQUIP. CORP.

BIG DIFFERENCE
BETWEEN CLAY AND EVERY
OTHER CLEANER IS...

NEW PULL-MORE CHAIN
OUTLASTS ALL OTHERS

- 10-YEAR GUARANTEE
- HEAVY ¾" STEEL RIVETS
- BENDPROOF LINK DESIGN
- PADDLES SPACED 16" APART
- FLAT CHAIN LINKS 5/16" THICK, 1⅓" WIDE. PADDLES ¼" THICK
- PADDLE HAS WEAR HEEL UNDER CHAIN
- 8 LB. PER FOOT WEIGHT (WITH PADDLES)
- HIGH CARBON STEEL FORGINGS (HEAT TREATED)

Stop shoveling manure. Make your barn modern, more sanitary. Eliminate hired help problems. Save your back. Invest in a Clay power cleaner. Get facts on how this cleaner will give you a bigger profit-making dairy from the same barn, same herd. Send for complete details today.

- ONE MOTOR, ONE DRIVE, ONE CHAIN.
- NO STINKING, FREEZING PIT OR HOPPER TO CLEAN.
- CHAIN RIDES 2" ABOVE CORROSIVE LIQUIDS.
- CHOICE OF 8 SPREADER POSITIONS.
- 3 SIZE CLEANERS TO CHOOSE FROM.

FREE CATALOG---
CHECK AND MAIL TODAY

CLAY
Clay Equipment Corp., 341 Fulton St., Cedar Falls, Iowa

Gentlemen: Please rush me
☐ Barn Cleaner Catalog
☐ Farm Windows
☐ Milking Parlor Stalls
☐ Crop Driers
☐ Cattle Feeders
☐ Comfort & Tie Stalls

NAME_____
TOWN_____
STATE_____ R. F. D._____

DAIRY BARN

Pasture In Spring

When the first snow-drop has been seen and the buds on the trees and bushes are growing too big for their skins and the very twigs themselves seem ready to burst through their bark, when the spring peepers are a noisy chorus and the furnace begins to take on that forgotten, neglected look, the dairyman begins counting the days until he can turn the cows out to pasture. There are reasons for being patient and holding off a bit. If you give the grass a chance to make a good growth and recover from winter, you'll have better pasture during the year. And the pasture will be better for the cows, too—the first growth has so little value it is hardly more nutritious than a drink of water. When the bluegrass is three or four inches high, then is the time to turn in the herd.

First pasture brings with it two dangers, prussic acid poisoning and bloat. Sudan grass, Johnson grass, and other members of the sorghum family as well as flax, chokecherries, arrowgrass, velvet-grass and laurel can all cause prussic acid poisoning, particularly in their early stage of growth or after they have been frost-damaged or when they are recovering after heavy pasturing. The animals will show the effects of poisoning a few hours after they've been turned to pasture. The symptoms are suffocation, frothing from a wide-open mouth, and the deadly almond odor on their breath. If treated promptly they may recover. Since treatment involves intravenous injections, call the vet. Bloat can be minimized by turning the herd on pasture for short periods until they are accustomed to it: put them on only when they are well fed. Feeding rough, scratchy hay during the early pasture period also seems to help. If a cow bloats, elevating the front legs will help. One farmer we know drove a cow part way up a loading chute and kept her there until she'd belched away most of the harmful gas.

Grain should be continued, but protein supplements can be stopped when the herd goes on pasture. Don't stop the minerals, however, for they may need extra minerals because they eat less grain. Mix one and a half pounds of salt and one pound of bonemeal with each 100 pounds of grain fed and provide a weather-protected box in the pasture with two parts of finely ground limestone to two parts of bonemeal and one part of salt.

Tale Of A Calf

An inseminator in West Virginia is taking an awful ribbing from one of his customers, C. W. Pyles, of Sisterville, who claims that the technician didn't use

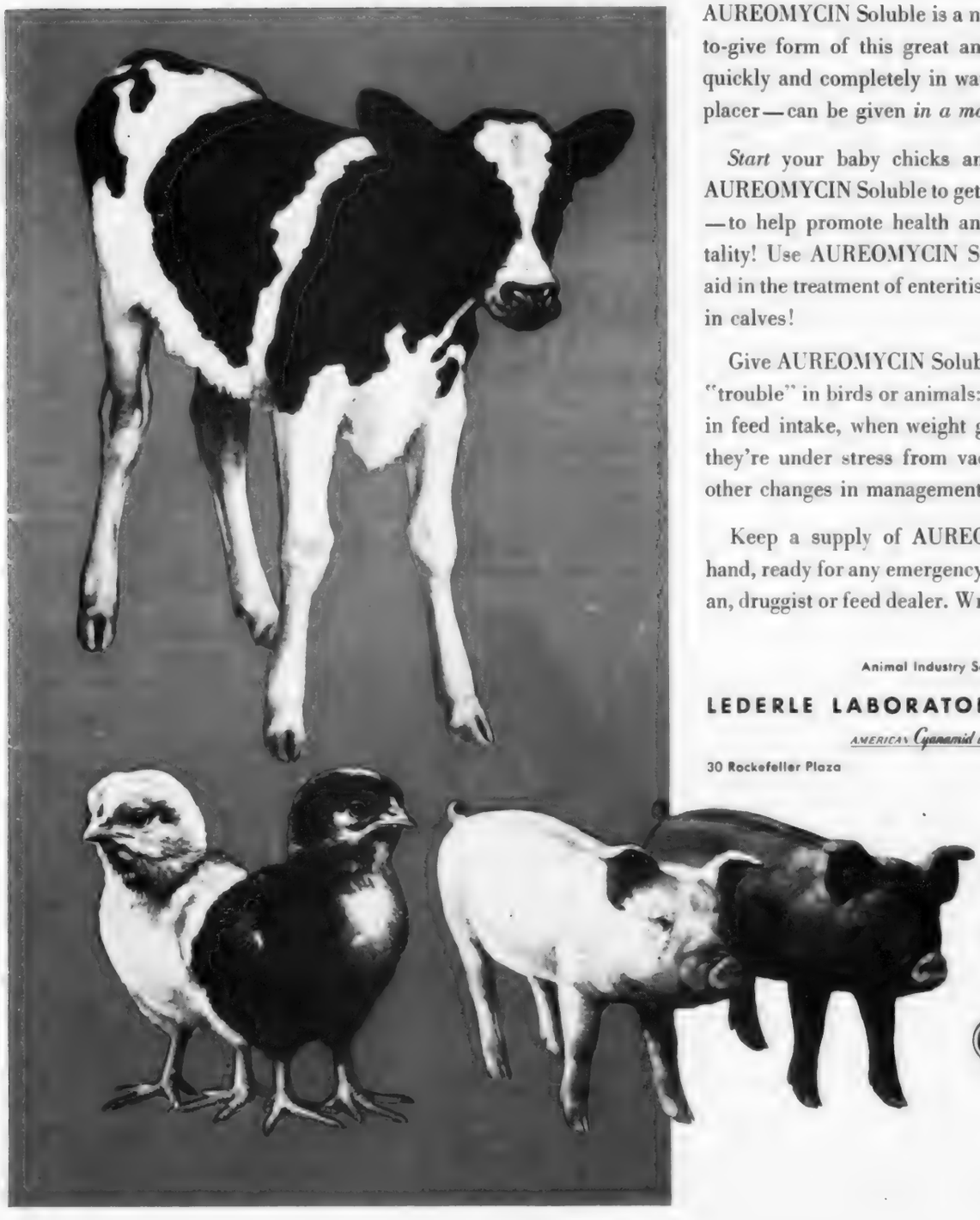
all the contents of the bottle. Result: the purebred Ayrshire shown here, which was born without a tail. Pyles was so disappointed in the calf that he was about to kill it, but finally agreed to give it

(*Continued on page* 141)

AUREOMYCIN* *Soluble*

CHLORTETRACYCLINE *Lederle*

...the NEW, more effective way, to get AUREOMYCIN to them quickly!



AUREOMYCIN Soluble is a new, convenient, easy-to-give form of this great antibiotic. It dissolves quickly and completely in water, milk or milk replacer—can be given *in a matter of minutes!*

Start your baby chicks and turkey poults on AUREOMYCIN Soluble to get them *on feed* quickly—to help promote health and reduce early mortality! Use AUREOMYCIN Soluble as a valuable aid in the treatment of enteritis in pigs and "scours" in calves!

Give AUREOMYCIN Soluble at the first sign of "trouble" in birds or animals: when there's a drop in feed intake, when weight gains are poor, when they're under stress from vaccination, moving or other changes in management!

Keep a supply of AUREOMYCIN Soluble on hand, ready for any emergency. See your veterinarian, druggist or feed dealer. Write for free literature.

*Trade-mark

Animal Industry Section

LEDERLE LABORATORIES DIVISION

AMERICAN Cyanamid COMPANY

30 Rockefeller Plaza New York 20, N. Y.

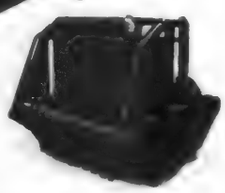
Lederle

DETROIT PUBLIC LIBRARY

KING-WYSE
Forage HARVESTER
AND EQUIPMENT

QUICK CHANGE ATTACHMENTS

CORN HEAD
Can be set to cut as low as 1 inch above ground.



WINDROW PICK-UP
Vertical side belts assure positive non-clog carry-thru to feed rolls; wide pickup, 51".

CROP BLOWER

Delivers forage crop to highest mow or silo. Top feed belt assures positive non-clog carry-thru to fan. Feed table lifts easily.

PORTABLE DRAG FEEDER

Handles ear corn, loose grain, forage crops, ensilage. Sturdy, well-balanced, easy to spot

TOPS the FIELD
in performance and PROFITS

Before buying any Forage Harvester, you owe it to yourself to see the high-capacity King-Wyse in operation. Exclusive vertical cutting head gives cleaner cutting knife action in hay, straw or corn, and other row crops. Positive-feeding, non-clog corn and hay units can be attached or interchanged in 10 minutes. Choice of engine-powered or PTO models. Simple, compact design, and extra rugged construction assure long service.

ALL-PURPOSE ELEVATOR

In 26', 34', 42' sizes. Handles ear corn, small grains, ensilage, bales. Automatic Safety brake. Trough 20" wide . . . Choice of 3 hoppers. Use gas engine or electric motor.

Write for complete information

KING-WYSE · INC · ARCHBOLD · OHIO

FARM BOOKS

The Ford Almanac—1954, Simon and Schuster, New York, $1.00.

For those who love reading the bits and pieces of information which are the heart and soul of an almanac, this is a beaut. John Strohm, who did a handsome job of editing this book for the Ford Motor Company who sponsored it, has collected over 200 pages of short items covering such useful information as the latest scientific discoveries in agriculture or such helpful hints as how to keep a stepladder from slipping or how to patch linoleum, on to items which are there just for the fun of it, like the calendar for fishing or the astrology chart for the year. The strongest single impression one gets from the book is the enormous change that is taking place in agriculture and the speed at which we are moving. The book also has fine visual impact with hundreds of amusing and colorful drawings by William Sayles, Otto Storch, and John Polak.

Planning Farm Buildings, by John C. Wooley, McGraw-Hill Book Company, New York, $6.50.

A farm building should last anywhere from 20 years on to a century and should be planned to keep up with the changes in agriculture that will take place during that time. And what will farming be like 50 years or more from now? No one can truly say, of course, but we do know that we want our buildings to be as functionally efficient now as we can devise them and to remain as flexible as possible for future change without interfering with their present use. There are a number of books and pamphlets on the market which will help the farmer in making his basic plans. One of the most useful which we have seen for some time is the new book by Professor Wooley, *Planning Farm Buildings.*

Professor Wooley discusses each building plan from the point of view of the housing needs of the livestock, farm produce, or machinery which it will contain. He also keeps in mind the cost of the building and the rent the animals or crops will have to supply the farmer to make the investment worth while. And finally, having established a building which provides the proper environment for its tenants, it must also be an efficient tool for the farmer to work in.

There are several chapters on the planning of dairy barns, both the open type loafing barn with milking parlour and the stanchion barn, and shorter sections on housing plans for hogs, poultry, sheep, beef cattle, hay, grain, and even on houses for the farmer himself.

(*Continued on page* 90)

Take a close look at this

new BUTLER farm building

. . . "most adaptable building I've used"

Says Foster Adams, R. R. #1, Lenexa, Kansas

"We can take any machine on the farm through those 20' Butler doors," says Mr. Adams. "The new building is just the thing for machine storage. Right for livestock, too! It's weather-tight, easy to partition, simple to clean. It's the most adaptable building I've ever used!"

See how you can use it for machine or feed storage . . . shop . . . livestock housing—or a combination of these uses. You can adapt the clear-span interior of this new 36' wide, 12' high sidewall Butler farm building to match your needs. You can get any length buildings in multiples of 20'.

Step inside and look at Butler's rigid framework. It gives you post-free floor space with room to turn big implements around, and park them where you like. It also furnishes structural strength for hoists to make repair work easier. Butler translucent Lite* Panls in the roof assure good natural lighting, too.

Look how quick and easy it is to move big machines in and out of this new Butler farm building. Wide, 20' doors—located in the sides to fit your convenience—give you clearance for self-propelled combines, 4-row implements and other large equipment.

Hear how this new Butler building is priced to make your farm building dollars go farther than ever. The initial cost is low. Quick erection cuts construction costs . . . gives you added savings. Butler's steel framework and long-lived, galvanized steel sheeting—sealed and bolted firmly—insure you year after year of good service with little or no upkeep.

You can store big implements in the new Butler building without having to waste time inching through small doors or taking equipment apart.

You keep grain safe, clean . . . keep storage costs per bushel low, in Butler grain storage buildings with 5,000 to 100,000 bushel capacities.

Your cattle and other stock are safe, comfortable in a Butler building—steel or aluminum. You can arrange pens and feed to save work, speed chores.

BUTLER STEEL PRODUCTS

See your Butler Dealer before you build

Call your nearest Butler dealer right away! Let him show you a few of the Butler buildings at work in your community. Talk to their owners. You'll see why it will pay you to build with Butler! Send coupon for name of Butler dealer nearest you and free folders by mail.

BUTLER MANUFACTURING COMPANY

Manufacturers of Oil Equipment • Steel Buildings • Farm Equipment • Cleaners Equipment • Special Products

Factories located in Kansas City, Mo. • Galesburg, Ill. • Richmond, Calif. • Birmingham, Ala. • Minneapolis, Minn.

For prompt reply, address office nearest you:

BUTLER MANUFACTURING COMPANY

7378 East 13th Street, Kansas City 26, Missouri
978A Sixth Avenue, S.E., Minneapolis 14, Minnesota
921 Avenue W, Ensley, Birmingham 8, Alabama
Dept. 78A, Richmond, California

Please send me the name of the Butler Dealer nearest me. Also free folders on Butler farm buildings.

Name .....

P. O. .....

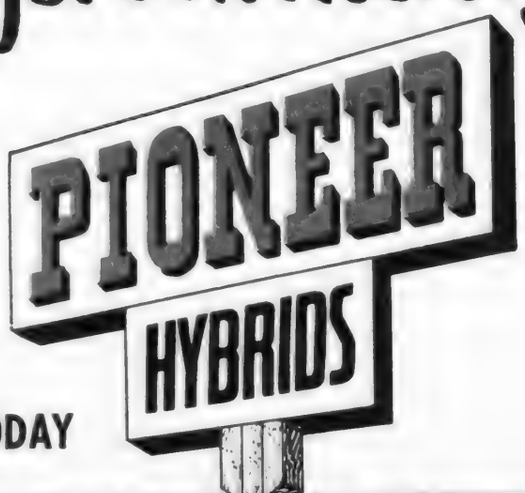
County ..... State .....

Many More Thousands of Farmers will plant Many Many Thousands More Bushels of

PIONEER

Hybrid Seed Corn in '54 than Ever Before in History!

Join the Big Swing to



SEE YOUR PIONEER SALESMAN TODAY

PIONEER Hybrid Seed Corn is produced by the following companies:

Garst & Thomas Hybrid Corn Co. — Coon Rapids, Iowa

Pioneer Hi-Bred Corn Co. — Des Moines, Iowa

Pioneer Hi-Bred Corn Co. of Illinois; Princeton, Ill.

Pioneer Corn Co., Inc. — Tipton, Indiana

"I decided on this steel building because of its sturdy construction"

says **MAURICE O. FULLER, Chalmers, Indiana**

MR. FULLER uses his steel building primarily for machinery storage. In addition to a tractor, light trucks and trailers, he keeps some earthmoving equipment in the shed. Particularly impressed by the strength of his steel building, he states, "I decided on this steel building because of its sturdy construction.

"I am more than satisfied with the steel building I bought to house our farm equipment," says Mr. Fuller. "Our farm buildings are quite close together, and in case of fire it would be a hard job to keep them all from going. With $30,000 worth of equipment in one building, that is something to think about."

And "think about it" is just what Mr. Fuller did. The obvious solution was a fire-resistant building—a *steel* building. "I do not have insurance of any kind on my steel building, as insurance is a big item on my farm," he adds, confidently.

Like many other farmers, Mr. Fuller has recently further improved his farm by the addition of another large factory-built steel building which he is now using to house his beef cattle and swine. This is additional proof of Mr. Fuller's satisfaction with steel buildings.

Practical-minded farmers know—you get the most for your money when you invest in a factory-made steel building manufactured with long-lasting U·S·S Galvanized Steel Sheets for roofs and side walls and a U·S·S Structural Steel framework.

USS

4-244A

UNITED STATES STEEL CORPORATION produces high-quality U·S·S Galvanized Sheets and Structural Steel which our customers manufacture into durable farm buildings. Your requests for information will be forwarded to the manufacturers of these buildings, and you will hear directly from them.

SEND THIS COUPON FOR FURTHER INFORMATION

Agricultural Extension Section, United States Steel Corporation
Room 4218, 525 William Penn Place, Pittsburgh 30, Pa.

I would like additional information about steel buildings for the following:

- ☐ machinery storage
- ☐ grain storage
- ☐ hay storage
- ☐ cattle shelters
- ☐ dairy barns
- ☐ poultry houses
- ☐ other .....

Approximate size or capacity .....

☐ Please have a steel building representative call on me. Send information to:

Name .....

Address ..... **Town** .....

County ..... **State** .....

UNITED STATES STEEL

B.F.Goodrich

Power-Grip Tractor Tire will do a great traction job for you, too!

It looks bigger—it is bigger!

It's the powerful, new B. F. Goodrich Power-Grip tractor tire, built to do a great job of traction. Knife-action cleats bite easily into the soil, take a firm, non-slip hold. Full traction in forward or reverse is the result, even in rough going. Power-Grip cleats are higher at the shoulders for deeper penetration, greater drawbar-pull. You can keep on schedule in any kind of going. You'll cover more ground in less time.

Bigger shoulders!

The bigger Power-Grip shoulders are reinforced at the base to give them extra support. They stand rigid even on hard surfaces. They bite into the soil without bending. And the shoulders are square cut to defy slippage. Every turn of a B. F. Goodrich Power-Grip tire counts for maximum traction. Dirt falls from the open-center tread and open channels as the tire rolls. Power-Grip tires stay clean, and only clean tires can give you full traction.

The B. F. Goodrich Power-Grip is the biggest tractor tire value on the market today. It's the tire that comes on new tractors.

Bigger cleats!

You get more tire, more working power for your money with the big B. F. Goodrich Power-Grip tire. The cleats have a bigger face area to press against the soil, pull you through faster. Count the cleats on leading makes. Time after time you'll find that size for size, the BFG tire has more cleats. And no other tire is wider than Power-Grip! A big, broad tread with extra cleats means greater power for you.

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That's what users call the BFG Heavy Duty Express truck tire. The tread is flat and compressed, will give you bonus miles of service at no extra cost. See your B. F. Goodrich retailer. He has tires for every farm need. The address is listed under Tires in the Yellow Pages of the phone book. Or write *The B.F.Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

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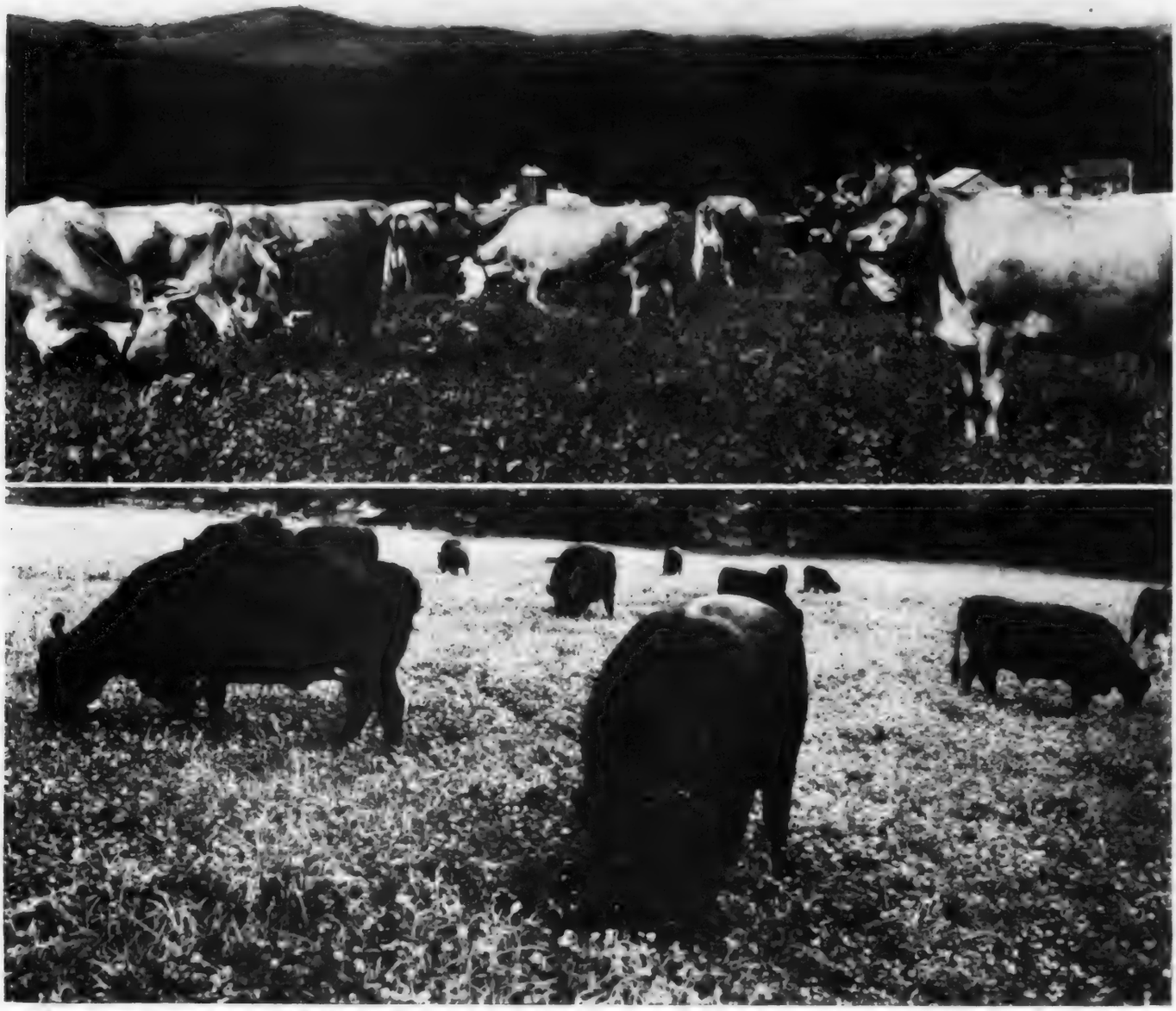
But good legumes can't grow without Phosphorus . . . and whether you supply it in the form of Superphosphate, in Mixed Fertilizers containing Superphosphate, or in finely-ground Phosphate Rock, Phosphorus is the basis of a profitable pasture.

Dairymen and Cattlemen from New England to Texas are getting exceptional results in building up their pastures by applying AA QUALITY Ground Phosphate Rock, and we suggest you try this low-cost way of building and maintaining an adequate supply of Phosphorus, the key to bigger yields and better quality crops throughout the rotation. From our mines to your farm for utmost economy—see your nearby Agrico or A.A.C. Fertilizer Dealer.



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DeKalb Research reveals and selects strains with high resistance to disease, discards all others. Sturdy parent birds pass on their stamina to their offspring—the chix you get from DeKalb.

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Thorough testing of thousands of birds, hundreds of combinations, discovers and proves the rare blood lines with two-fold layability—to start laying early and continue steadily throughout the year.

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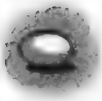
DeKalb poultry breeders, never satisfied, screen and rescreen the blood lines in endless search for chix which grow fast, mature early, start young on long laying careers.



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Research follows through to market eggs from DeKalb Chix, makes special tests for the upstanding yolks and firm, round whites that discriminating housewives demand.

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Continuous probing of the chemistry of the corn kernel, is creating new varieties—both grain and silage types—for better content of sugars, oils and proteins.

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For 14 straight years More Farmers have planted DeKalb than any other seed corn!

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ARO-FIL . . . handy new drum-cover type gun filler for volume delivery from 25 or 40 lb. containers. Will fill the ARO-PAK in just a minute. Price of ARO-FIL, $10.95.

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Many leading farmers have doubled and tripled corn yields by greatly increasing their use of V-C Fertilizer. This means that they get two to three times as many bushels from their investment in land, labor, machinery, seed, fertilizer, insect control and other expenses.

The extra bushels added to your yield by V-C Fertilizer are the most economical and most profitable bushels you produce. When you double or triple your per-acre yield with V-C Fertilizer, you greatly reduce your costs per bushel and increase your net return. You are in a better position to make money from your crop whether corn prices are high or low.

Start now to get big yields of high-feed-value corn at low cost per bushel. Use good seed, approved cultural practices, close spacing, insect control and a heavy application of V-C Fertilizer.

THE RIGHT FERTILIZER FOR YOUR CROP!

VC FERTILIZERS®

Ask your County Agent how to produce really big yields of corn...and then see your V-C Agent. He will supply you with the *right* fertilizer for your crop. Each V-C Fertilizer is a rich, mellow blend of better plant foods, properly balanced to supply the needs of the crop for which it is recommended. Produced by a national organization which has manufactured better fertilizers since 1895, V-C Fertilizers are your best investment. Use more in 1954!

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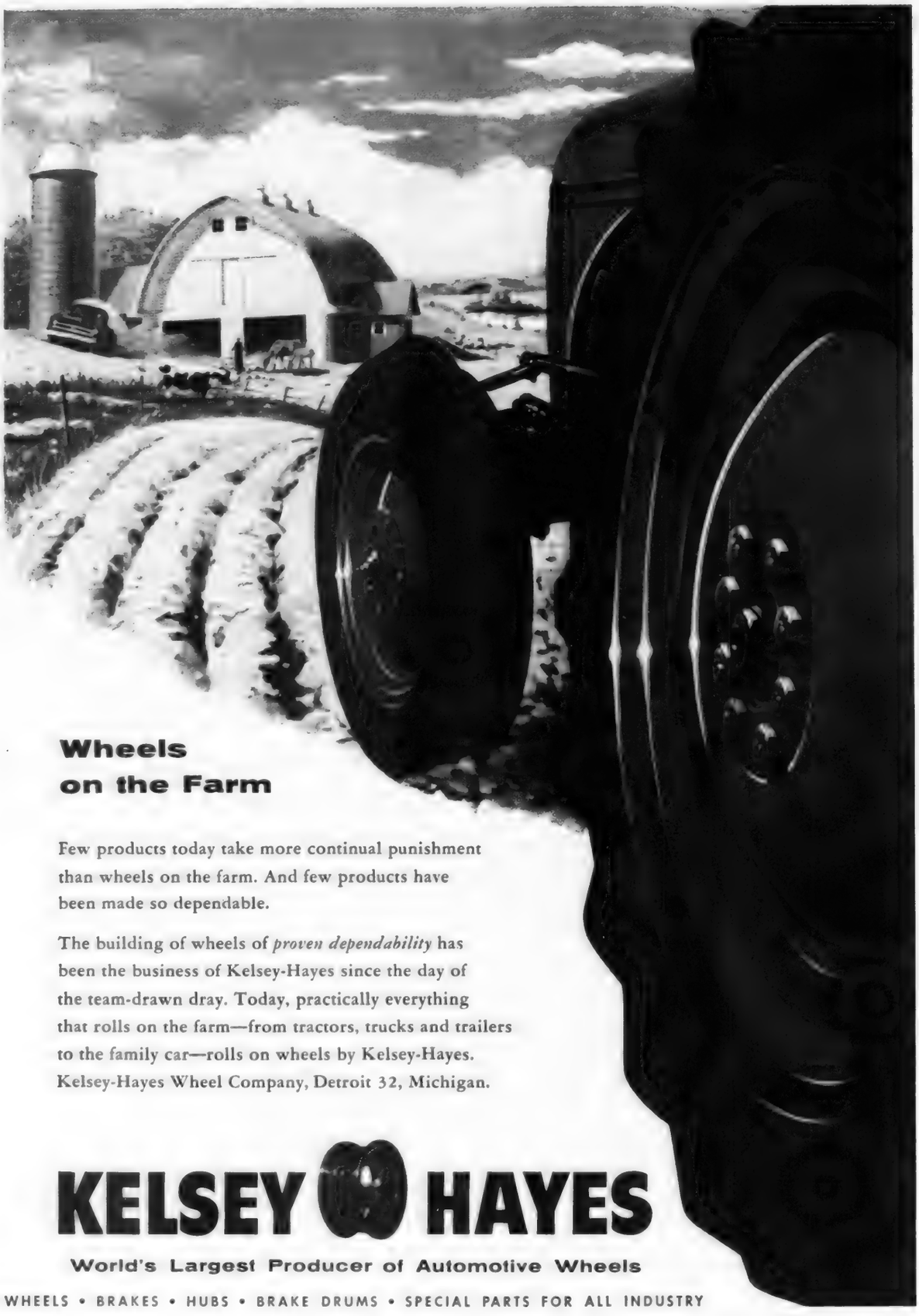
When you buy V-C Fertilizers to grow profitable crops, place your order for Black Leaf sprays or dusts to protect your crops from insects and other pests. V-C Fertilizers and Black Leaf pest control products work together to produce and protect big yields.



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The building of wheels of *proven dependability* has been the business of Kelsey-Hayes since the day of the team-drawn dray. Today, practically everything that rolls on the farm—from tractors, trucks and trailers to the family car—rolls on wheels by Kelsey-Hayes. Kelsey-Hayes Wheel Company, Detroit 32, Michigan.

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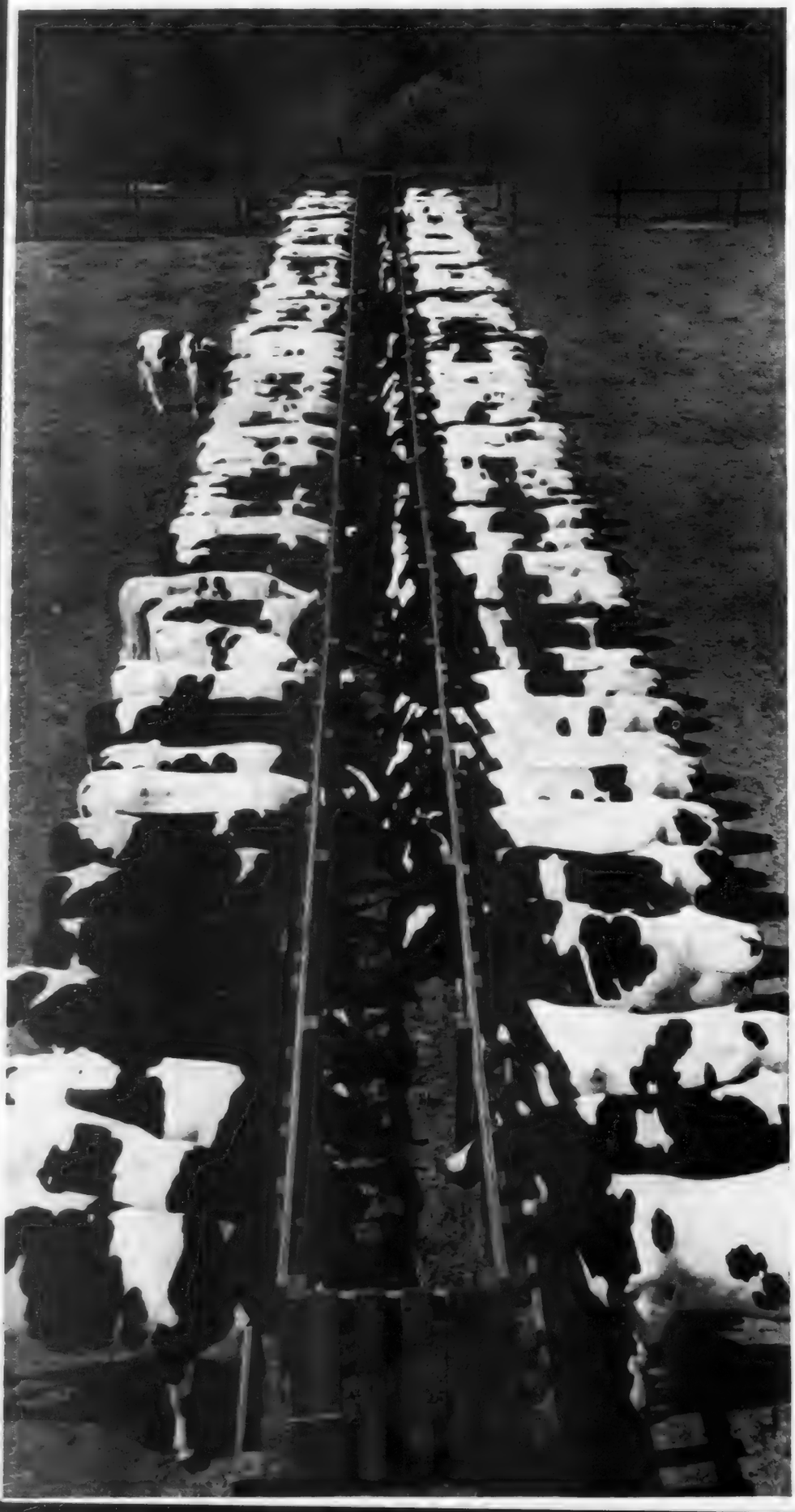

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Big-capacity Registered Holsteins are the breed of the times — the breed that produces many cows weighing over a TON . . . cows that utilize TONS of low-cost home-grown grass and forage . . . to make TONS of milk economically for Holstein owners.

Big things are shaping up in dairy farming. Dairy specialists proclaim the value of *bigger* cows, giving more milk at a lower unit cost with more profit to the owner. Such cows are efficient, high-producing Registered Holsteins!

The spectacular herd pictured is producing over 2½ tons of milk each day. More and more dairymen are turning to Registered Holsteins for milk in quantity, produced at lowest cost from modern roughage.

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Registered HOLSTEINS
Breed of the Times

there's a new quality FEEL... it's **ROLLED IN**

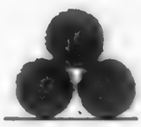
When a cow reaches for hay in a ROLLED bale, she immediately senses a difference!

There's a softness she likes . . . no broken ends or crumpled wads. The whole plant is gently rolled full length into the bale. Leaves are left intact . . . *rolled in* . . . not shattered and lost.

And your hay *keeps* that quality. Only ROLLED bales give hay "thatched-roof" protection. They repel moisture . . . in the field, in outdoor feedlots, or for self-feeding when left on the range.

There's a different feel in handling, too! ROLLED bales won't buckle or break. They're easy to load . . . handy to haul and store. They nest compactly, or can be dropped at random in the haymow with hayfork or elevator.

Your own big-capacity ROTO-BALER lets you bale *fast* . . . when the crop is ready. See your dealer now. Give your hay that new *quality feel*—this year!



They're SELF-LOCKING! Rolled bales handle, haul and stack better! They nest like cigarettes in a pack. Pressure of upper bales keeps lower bales locked securely together. (See diagram)

Ask your dealer about the new ***SOFT-CENTER baler attachment,*** now available at nominal cost. It starts the bale under lower compression; keeps the center soft for better air circulation and curing. It's an added assurance of quality where higher moisture content is a problem.

ROTO-BALER is an Allis-Chalmers trademark.

SOLUTION 32 is a natural for aerial application. The distribution is more even, there are no heavy bags to lift and the job can be done when the field is too soft for ground equipment. Costs run from $4.50 to $5.50 per acre, including the cost of the material.

New Ways to Use NITROGEN

RECIPE for bigger yields—add nitrogen!

J. H. Roadruck of Brookston, Indiana, did it with anhydrous ammonia last year and won the corn growing championship of his state with 188.5 bushels an acre. Charles Schenk, Vincennes, Indiana, beat the drought and upped his yield from 57 to 99 bushels with Uran, a nitrogen solution. Down in Kenutcky, Thurman Pharis, of Hickman County, grew 91 bushels an acre in spite of scanty rainfall. He used one of the old standbys, ammonium nitrate.

Now this isn't to say that nitrogen is the only element essential to increased yields. Farmers have long been aware of the need for balanced nutrients and have used mixed fertilizers with increasing success. But the economic pressures for increased yields per acre, and the continued depletion of our soil nutrients is demanding more concentrated doses of plant foods than can readily be applied in mixed fertilizers, while the relative cheapness of nitrogen carriers makes them an essential tool for all farmers.

Nitrogen is absolutely essential to growth and reproduction in plants and animals. When the available supply of soil nitrogen becomes locked up in the midst of a hot dry summer, the plant tries to compensate for its lack by giving what little there is to the tips of the leaves and stalks, the newer and more rapidly growing parts, and it neglects the older, more mature lower parts. That's why the lower leaves on the corn are the first to discolor and die under such conditions.

And the strange thing is that while the plant is withering away for lack of nitrogen, there may be 3,000 to 4,000 pounds of that very element in the soil; but it just isn't in an available form. It is in an organic form that plants can't use until the soil microbes break it down into ammonia or nitrates.

These latter forms, which man has now learned to turn out in abundance, can be applied in commercial fertilizers, some of them of extremely high analysis, and with striking results.

Comparison of Nitrogen Fertilizers

Material	Percentage of Nitrogen	Acidity or Alkalinity	Retention by the Soil
Ammonia (anhydrous)	82	Acid	Medium
Urea	46	Acid	Medium
Ammonium nitrate	33	Acid	Low
Solution 32	32	Acid	Medium
Ammonium chloride	26	Acid	Medium
Ammonium sulfate	21	Acid	Medium
Calcium cyanamide	20	Alkaline	Medium
Sodium nitrate	16	Alkaline	Low

By Ellis Rawnsley

For example, all the other nutrients being in balance, 2.2 pounds of commercial nitrogen (about 33 cents worth at the current average price of 15 cents a pound) applied to land low in nitrogen will produce an extra bushel of corn (worth about $1.50); three pounds of nitrogen will return an extra bushel of wheat; two pounds, an extra bushel of barley. Besides these tangibles it will provide insurance against drought and hasten the maturity of fall seeded grains.

Three Forms of Nitrogen Fertilizers

The dry forms of nitrogen fertilizer are pretty well known to the farmer. The most popular ones are sodium nitrate, ammonium nitrate, ammonium sulfate, calcium cyanimide and a more recent development—urea. These have a nitrogen content of anywhere from 16 per cent (sodium nitrate) to 46 per cent (urea). Being in dry form, they are bagged and there's a backache in every bag.

The gaseous form of nitrogen is anhydrous ammonia, 82 per cent introgen; and even newer than that is the liquid form, Solution 32, sold under the trade name of Uran. This carries 32 per cent nitrogen.

Which of these forms to use is a matter of choice for the individual farmer depending upon availability of the material and the equipment for handling, the crop to be raised, the type of soil and even the time he has to do the job.

Another point to be taken into consideration is whether, in a particular instance, it is better to use the ammonia or the nitrate form of nitrogen. Ammonia (NH_3) is a combination of nitrogen and hydrogen. It is not leached from the soil as readily as the nitrate form. Corn, rice and cotton seem to have a preference for it. The nitrate form (NO_3) is a combination of nitrogen and oxygen. It is highly soluble, a form readily available for plant food (as a matter of fact it is believed that all nitrogen must eventually be reduced to this form before it is useable by plants), and is easily leached out of the soil or carried by water to levels far below the plant roots.

To compare the adantages and disadvantages of these three types—gaseous, liquid and solid—let's consider them one at a time.

Anhydrous Ammonia

Anhydrous ammonia, the gaseous form with its 82 per cent nitrogen is the most concentrated of all nitrogen fertilizers and a good one with which to begin. Actually, it is stored and spread as a liquid under high pressure (221 pounds per sq. inch) and released underground as a gas. It is particularly good as a side-dressing for corn—if you're the type who likes to side-dress. Some insist that side-dressing is only for those who forgot to put enough fertilizer on the first time over. One of the top advantages it has to offer is that on heavy soils it can be put in the ground during the fall or winter prior to planting without danger of its nutrients being leached away before the plants

Ten Pounds of Fertilizer Nitrogen per Acre Produces

Kind of Crop	Estimated Crop Increase	Value*
Corn	3 to 5 bushels	$5-9
Cotton	100 to 140 pounds seed cotton	11-16
Wheat	2 to 3 bushels	5-7
Rice	3 to 5 bushels	7-12
Cabbage	175 to 250 pounds	4
Tomatoes	650 pounds	10
Potatoes	6 to 8 bushels	10-13
Sugar (from sugar cane)	130 pounds (from 1130 lbs. of cane)	5
Sudan Hay Grass	300 to 400 pounds	4-5

*September 15, 1953, parity prices from BAE, USDA

can use it. It is in effect held in "cold storage" until spring. This happens because at a soil temperature of 60 degrees or less, the ammonia ion is held by the clay particles of the soil. At higher temperatures the ammonia is gradually converted to the nitrate form.

Don't forget, though, that this fall application is advised only for heavy soils. On light, sandy soils there is always the possibility of more or less rapid nitrification and leaching, that makes application just before planting or as a side-dressing a more economical practice.

On wheat, anhydrous will produce results comparable with spring top-dressing when applied just ahead of the drill—again, this is on heavy soils. It's a good material for spring top-dressing, too, if the weather will let you get it on.

Because anhydrous has to be handled under pressure and needs special equipment, its application has been largely a custom job. This fact has been of some advantage in itself to the farmer. He has been able to turn over the application job to the custom operator while he was attending to one of the multitude of other chores that are always demanding his time, especially during the season when anhydrous should go on.

Anhydrous sells for anywhere from 7 to 11 cents a pound, depending on location. Buying it at a median figure of 8½ cents, a custom operator will ordinarily charge the farmer 10 cents a pound to cover his over-the-road handling, and $2.50 an acre for application. That makes a 100 pound application cost $12.50: and since the anhydrous is 82 per cent nitrogen it brings the total cost per pound of nitrogen applied to about 15 cents.

If a farmer feels justified in buying his own application equipment it will cost him anywhere from $1450 to $2400, depending upon the size of the distributor. He'll need a storage tank on wheels, to carry the ammonia to his farm and store it there. A thousand gallon tank, figured as the minimum needed, will cost around $1,000. Then a distributor, or "shooter," to put the stuff in the ground will cost another $450 to $1400. This shooter consists of a pressure tank of 100 to 150 gallon capacity with two to five knives adjustable for depth and width to open up the ground and put the ammonia beneath the surface. Small tubes running from the tank are attached behind each knife and carry the gas to the desired depth.

It is a good idea to check with local extension people or dealers for recommendations as to rate of application, but in general 80 to 100 pounds is the recommendation for corn and pasture, 40 to 50 pounds for small grains.

The high pressure feature is probably the biggest drawback to the use of anhydrous ammonia, but this need not cause the operator too much concern. The tanks to handle the material are built with ample safety margins. Accidents have been rare and only when farmers have ignored the recommended handling practices. Transfer of the liquified ammonia from the storage tank to the shooter is a simple process and a lot easier than lifting 80 to 100 pound bags. A special hose is coupled from one tank to the other and a bleed-off valve on the shooter is opened. The difference in pressure between the two tanks causes the liquid to flow from one to the other and a spurt of liquid from the bleed-off valve is the signal that the transfer has been completed and the valves should be closed.

The Camel, The Padre, and Nitrogen

The absolute dependence of plants and animals on nitrogen for growth and reproduction is no new discovery. Ammonia, one of the basic nitrogen compounds, got its name from its discovery in ancient times in camel dung before the temple of Jupiter Ammo. In more recent times, a Padre working in what is now northern Chile, at the time of the Spanish Conquest, accidently stumbled upon the life-giving properties of the nitrate deposits of the Chilean desert. After working with bits of "fire rock", which had been brought to him by some of his Indian parishioners, he dumped the remains out of his workshop window. Soon afterwards, he observed the vigorous appearance of the plants beneath the window. He spread the crushed rock in other parts of his garden and found the results were always the same—rank, vigorous, healthy growth.

That was the beginning of the Chilean nitrate industry. Until rather recently, these deposits were the principal source of nitrogen for the world. But Chilean nitrate of soda is relatively low in nitrogen (16 per cent) and the pace of today's farming demands fertilizers of higher analysis. Today most nitrogen carriers are made synthetically from air, or are a byproduct of industry.

ON HEAVY soils, the ammonia forms of nitrogen can be put down any time during the winter. It will still be there for the crop when the ground warms up. This anhydrous ammonia is going on a grain crop in midwinter. It's cold work but it will pay off.

The operator should wear gloves during this transfer, chiefly as a safeguard against the extreme cold caused by the expanding gas that inevitably escapes in the process, and which could freeze flesh to metal parts: he should stay up-wind of the equipment to avoid contact with the gas which is very irritating to skin and eyes; and the transfer should always be made well out in the open. A super-cautious operator might use a gas mask, but experienced handlers say one isn't really necessary and few, if any, custom operators use one. A quick flushing with water will prevent a burn if a drop of the liquid should reach the skin.

Where to get anhydrous ammonia is a question that can best be answered by your local extension agent, your state agricultural college, or by addressing a card to the Agricultural Ammonia Institute, Claridge Hotel, Memphis, Tennessee.

Solution 32

Now on the market in limited amounts are liquid forms of nitrogen under no pressure whatsoever, which can be applied with ordinary farm spray equipment. One of these is called Uran, or Solution 32, because of its 32 per cent nitrogen content. It is a 50-50 solution of ammonium nitrate and urea (another ammonia) in water. Tests bear out the manufacturer's claim that it gives amazingly good results as a nitrogen fertilizer for direct application to the soil in the fall or spring.

The general recommendation is to spray it on the ground, then plow it down. You don't have to worry if you can't get it turned under right away since the cold weather will hold it in an inactive condition. This solution is so new that few farmers have had an opportunity to try it.

EVEN WITH hopper capacity tripled, Vic Armstead won't be able to provide nearly as much nitrogen for his corn by putting it in the row as part of a mixed fertilizer as will his neighbor (below) who is side-dressing with the new Solution 32. The high-boy is mighty handy for spraying, detassling, and sowing cover crops in the standing corn.

through clovers. In commercial form he can buy it for 15 to 20 cents and as the industry advances and matures that price may be reduced somewhat."

In detail, here's how to use Uran. First of all, unless you are going to introduce it into irrigation water, which can be done very easily, it is not recommended that it be diluted at all. Secondly, remember that under certain conditions, depending upon temperature, humidity, and stage of growth of the plant, it will burn growing tissues.

Most farmers will probably find that Garst's method of spraying it on crop residues and turning it under is the most convenient way of using it. It is particularly effective when handled in this manner to aid in the decomposition of stalks, green manure, cobs or other organic matter that has been introduced into the ground. Like anhydrous ammonia there is little danger of its leaching out of the soil before the new crop begins to use it.

It can be used as a side dressing on corn, but should never be sprayed on after the corn is knee-high (some say after it is seven or eight inches high) as it will cause burning. At this stage it should be put right on the ground by dribbling from a hose or orifice close to the surface.

The best time to apply it to small grains and grasses is when they are in a dormant condition. Here, again, burning is apt to result if the solution is applied when growth is vigorous.

As with any other fertilizer, the rate

(*Continued on page* 101)

But you can bet your life that Roswell Garst has. He is a leading advocate of commercial nitrogen fertilizers, so it isn't surprising that he and his Coon Rapids, Iowa, neighbors used 11 carloads of Uran on their farms last fall.

His method of handling it: "We simply spray it on the crop residue of the preceding year and plow it under. We have spread it on oat stubble in August, soybean stubble in September, cornstalks in October. It is not evaporable and we think there is no loss whatever. We have put it on cornstalks in the fall of the year with the intention of getting them plowed under and then had it freeze up when only half the field was plowed; then we'd finish the plowing in the spring and we've never noticed any difference.

"The solution's great advantage, so far as we are concerned, is labor-saving. We believe that the human back is too valuable and delicate a tool to use in lifting 100 pound bags of dry fertilizer when you can pump liquids and spray them on.

"This year we are applying from 300 to 400 pounds an acre. That gives us something above 100 pounds of actual nitrogen per acre, which we consider about right for this area.

"One thing I am completely certain of is that it costs the average farmer 75 cents to a dollar a pound to raise nitrogen

This new alfalfa's rhizomes push out beneath the soil to send up new branches. Heavy soils restrict this spreading growth.

Alfalfas That Spread

Two new alfalfas that thicken their stand over the years

FROM the west coast of Canada comes a new alfalfa that has features quite new to America's No. 1 pasture plant—instead of petering out in three, four or five years, this new variety gets thicker every year. It is winter hardy, drought resistant, and will hold its dark green color and fight back longer than most other alfalfa when leaf hoppers and disease attack its foliage. But its most exciting quality is its ability to broaden its crown by sending out rhizomes, lateral branches beneath the soil, which push out as far as 10 inches and then send up new shoots. And, as if this were not enough to start farmers asking for seed, this new variety, Rhizoma it is called, has finer, more palatable stems with a higher protein content, and produces yields which compare well with any alfalfa grown.

Rhizoma has one serious defect. It is not wilt resistant. When the bacteria which carry wilt disease enter its root system, the vital water-carrying tissue is filled with their gummy secretion, the leaves yellow, and the plant dies. This is a real drawback, for wilt is present in most places where there are large acreages of alfalfa. Before we developed wilt-resistant varieties, this disease discouraged more farmers from planting alfalfa than any other factor.

Rhizoma is a selection made by Dr. G. G. Moe, of the University of British Columbia, from a natural crossing of the old winter hardy alfalfa, Grimm, with a wild alfalfa, Don, which was brought to this country in 1906 by Nils Hansen, the American plant explorer. Hansen found this yellow-flowered variety growing on the wind-swept steppes of Siberia and brought it home.

Don is a low-growing, scrawny looking plant that few farmers would have in their pastures. In Alaska they use a similar type because its extreme hardiness makes it possible to grow it on land which has but 10 inches of summer-thawed soil above the permanently frozen sub-soil. Don is technically classified as a *diploid falcata* variety which means that it has one-half the chromosomes of our domesticated alfalfas. This creates a serious problem for the plant breeder.

Crossing Don with the domestic variety, Grimm, was solved for Dr. Moe by nature herself. The bees and butterflies did the job. Dr. Moe studied a number of these natural crosses and selected the one most suitable for farm production.

In the light soils of British Columbia, where Rhizoma was born, this new alfalfa is seeded at the rate of four to six pounds to the acre on fertile, moist soil. Within a year the plants are sending out their characteristic underground branches and thickening the stand with new shoots. Later, the new clumps in turn send out rhizomes to make an even more luxuriant growth.

This tendency to increase the size of the crown through rhizomes is a matter of vigor and degree rather than a new, built-in feature. All alfalfas do it to some extent—even such a narrow-crowned variety as Arizona Common produces a few rhizomes. But the difference in the production of rhizomes between Rhizoma and most other varieties is as great as the difference in milk production between a Holstein cow and a Rocky Mountain goat.

Rhizoma also boasts a root system which is more branching and abundant than most other varieties and a crown that is parttially submerged beneath the soil. The vigorous root system probably accounts for Rhizoma's ability to withstand drought; and the submerged crown is probably a factor in its extreme winter hardiness. As one agronomist put it, "It stands to reason that a layer of soil over the crown will insulate and protect the plant. After all, that's why we heap earth over our rose bushes in the winter."

Above the ground, Rhizoma has somewhat thinner stems and is a bit leafier than most other varieties. The thin stems give it a tendency to lodge sooner than the more rugged varieties. Some farmers claim, however, that the Rhizoma stem cures faster and for this reason the plant holds more of its leaves when it goes through the baler.

J. Blackburn, of Dry Ridge, Kentucky, who milks around 25 head of Jerseys, tried planting Rhizoma and testing it against two other alfalfas, Ranger and Atlantic. "The results we got with Rhizoma were almost unbelievable," Blackburn said. "We seeded the Rhizoma at the rate of two pounds to the acre as compared to eighteen pounds for the other two varieties. As you would expect, the Rhizoma looked pretty thin when it first came up as compared to the other two which were planted right beside it. By the end of the first year, however, the Rhizoma stand had thickened considerably. I kept a careful check of production during the first year of cutting and we took two tons to the acre from all three varieties. The Rhizoma hay is greener, has more leaves, and seems to be more palatable than either of the others.

"We dug up some of the roots—as a matter of fact the Soil Conservation man has dug out so many plants I keep a spade and pick handy for him and wonder how long the field will last—and we've found that the Rhizoma has sent out underground stems which send up new shoots four and five inches away from the mother crown."

Blackburn planted his Rhizoma in relatively well fertilized soil which is free from bacterial wilt. In heavier soils, the ability to send out rhizomes seems to be very greatly reduced. In such heavy soils as cover most of Wisconsin, Rhizoma broadens its crown, but doesn't send out long underground stems to creep over the field. "The description of Rhizoma as a creeping alfalfa has disappointed the farmers who have grown it around here," Dale Smith, a University of Wisconsin Agronomist, said. "They expect Rhizoma to creep something like ladino and it just won't do it here. We prefer to call it a broad crowned alfalfa."

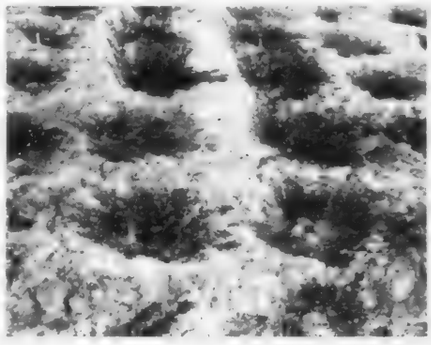
The Defect

Smith has made a number of tests of Rhizoma in Wisconsin, the state which grows almost a half million acres more alfalfa than any other state in the Union. Each test has shown the same results. Rhizoma shows itself to be one of the most winter hardy varieties the first winter; it establishes a good broad crown and yields reasonably well the second year; and the third year it dies of wilt.

"Rhizoma may be a good crop for an area that doesn't *yet* have wilt," Smith says, "but in Wisconsin or any other part of the country where the wilt bacteria are present, this disease will ruin it before it has a chance to show off its best feature, the ability to broaden its crown. And you can't stop will on a practical basis with fumigation, soil treatment, or spray."

The wilt disease is spread by a bacteria which lives in the soil and can travel through the air as a dust or be carried by the water draining off a field. "When wilt hits a field of alfalfa it is the sorriest sight you've ever seen," a farmer who has lived through such an attack said. "First you see patches of yellow, dying plants in

(*Continued on page* 126)



THE SPREADING CROWN (left) of Rhizoma alfalfa can be seen after the first year of growth. In two or three years the rhizomes will have filled in all of the space between plants. The check-row arrangement was achieved by planting root cuttings rather than seed in order to measure the crown spread accurately.

WINTER HARDINESS is an outstanding characteristic of Rhizoma. It is not, however, resistant to wilt disease. Vernal alfalfa, which is similar to Rhizoma in breeding and growth habits, is both winter hardy and wilt resistant.

Country Smoke

WHITE WATER TOWNSHIP in Hamilton County, Ohio, is a long, lean township running north and south along the Great Miami River. Until four years ago, the farms in this township had no fire protection closer than eight miles away, which was about the same as saying no fire protection at all. The trustees were not negligent, however. Several disastrous farm fires prompted them to buy three small trailer kicker pumps, which they housed in small sheds in the northern, the southern, and the central sections of the township.

It is supposed that their idea was that someone would hook the trailer behind his car, provided he had the right hitch, and haul it to the fire. A small gasoline engine operated the pump on this contrivance. One of the pumps was placed in a small garage in Miamitown, the village trading center of the northern portion of the township. Across the street from the pump lived electrician Siegfried Braune, who was asked to keep his eye on it.

People like Siegfried get to thinking. And the whole system seemed very impractical to him. He thought of how useless that pump would be in case of a real fire and how many barns could burn to the ground before somebody with the right hitch and the right spirit happened along and got the thing to the fire. He asked around and discovered that no one in the township even knew how to operate the pump.

That did it. Siegfried took the bit in his teeth. He sent postcards to twelve of his friends and one evening they took the pump down to the river and practiced. Just in time, too, for soon after

THE MIAMITOWN fire truck roars out of the fire house, the firemen throwing on their raincoats as they climb aboard. Chief Siegfried Braune sits beside the driver. They know where they are going, and how to get there, and someone knows the layout on the threatened farm.

Modern equipment and training are reducing rural fire hazards
Farmers are organizing to fight their own fires

Eaters

By Leland and Rita Puttcamp

that a shack near the edge of the village caught fire. Fortunately someone with the right coupling was near the "fire house" and got the pump to the fire in time to save the shack. Siegfried and his twelve friends were the unofficial fire fighters and heroes on this occasion.

The fire created a lot of interest in the budding department, so on his own time, Siegfried shopped around for used equipment of a more practical nature. On Hopkins Ave. in Cincinnati, he finally located a 350-gallon tank truck, which had been a demonstrator. The original price had been $8,700, but he could have the truck for $4,500. It had a 500 gallon per minute capacity, and that inspired Siegfried.

The entire northern end of the township was canvassed and $2,225 was raised by subscription. A Miamitown feed dealer signed a note for the balance. The fire truck was brought home and stored in the feed dealer's private garage. The dealer became its first driver. In spite of the fact that there was no hose on the truck, the people of Miamitown breathed with relief. Siegfried and his friends finally tracked down some hose from army surplus, bought a siren, and had wires from the siren strung to a near-by home where a three-way telephone and a switch to the siren were installed.

Today, the Miamitown Fire Department is a private corporation under the laws of Ohio and sells its services to the township, which pays the department $1200 per year for an unlimited number of runs within a three-mile radius of Miamitown.

To further its scope of protection, the department has contracted with the trustees of Colerain Township, immediately across the Miami river, to answer fire calls at $75 per run. That protection costs the Colerain trustees not less than $450 per year and not more than $900. . . . a pittance for being able to sleep nights.

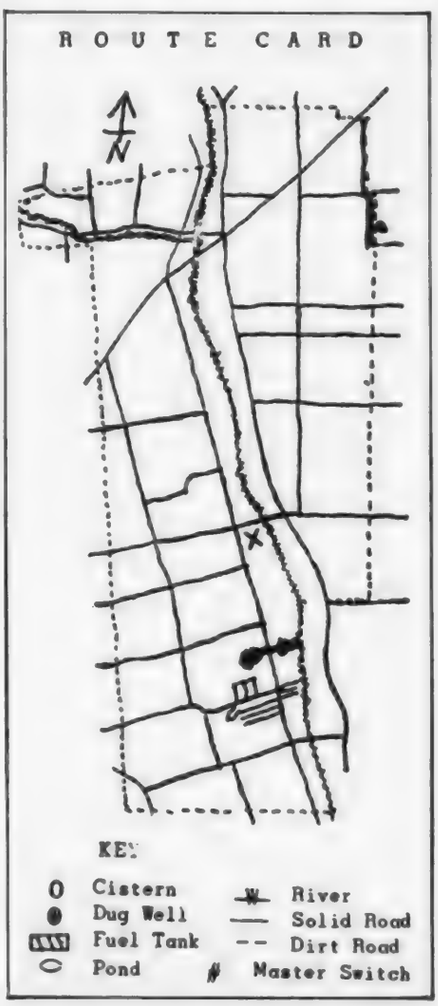
Siegfried Braune is fire chief in Miamitown. When more than fifty men volunteered for service in the department, an expert from the State Division of Vocational Education was hired, at the cost of $100, to give the volunteers instructions in fighting fires.

The women formed an auxiliary and in one year, by bake sales, suppers, and rummage sales, raised $1400 for the department. They paid $1000 on the note and used the other $400 for boots, coats, and other small but important equipment for the firemen.

The men reviewed the various methods by which volunteer fire departments across the country raise funds and decided upon a carnival. In 1951, their carnival, or festival as they choose to call it, raised $2000; in 1952, $3500; and in 1953, $3800. They bought new equipment, an 850 gallon water truck, hand extinguishers, power extinguishers, and various foam and spray equipment. A second-hand ambulance, purchased for $175, added ambulance and accident service to their fire-fighting duties.

The old siren wasn't adequate, so they purchased a 5½ h.p. job which the trustees permitted them to mount on top of the township house. The siren can waken the quick and the dead to the far edges of the township. But the Miamitown department found that if the electric current is off no siren will sound the tocsin. This happened when the Gulf Refinery loading dock burst into flame. Volunteers made shift by pulling one piece of equipment into the street and sounding its siren.

Across the street from the fire house, which is now in the basement of the town hall, there is a watchman on duty, usually a volunteer from the auxiliary. When there is a fire, the watchman receives the call and sets off the siren.



WHEN A brush fire gets out of hand or a pasture catches fire, portable chemical and water extinguishers are needed to stop them.

ON FILE in the firehouse is an information card (left) on each farm in the district, with a clearly marked route. The card (above) in bright colors hangs near the telephone in every farm home.

The department is now installing a short-wave system so they can work in cooperation with the county sheriff and his dispatching office. A light plant, which will cost about $400, is on the want-list for the near future. This is an important piece of equipment in fighting rural fires, particularly in woods and grass fires where the terrain is rough.

The Miamitown Department was given its first real test last fall when a truck loaded with molasses went out of control on the long, steep hill above Miamitown, crashed through one building, then through a series of telephone and light poles to bury itself in a second building. Gasoline from the over-turned truck caught fire and annihilation threatened the village. Twelve garages and two business buildings were destroyed, but the remainder of the town was protected, even though the majority of the homes and stores were of frame construction. It took the cooperating members of the Ohio-Indiana Fire Fighters Association and their equipment from 12 centers in the county to bring the fire under control.

Miamitown volunteers assemble to clean and polish their equipment and to talk through their fire-fighting practices whenever they have a spare moment. Each year, before the festival, they visit each farm to sell tickets and while there familiarize themselves with the farm building layout. There has been no farm fire of major destructiveness since the unit was established, for it can get rolling in a remarkably short time. Good highways in the county permit the trucks to "lay out and roll" and so get to a fire before the barn is entirely gone.

If the farm or the fire is off the road, the first arrivals drop a flare or flag to direct the other volunteers and equipment.

Miamitown has come a long way in four years, for from no protection to full protection is a long, hard road, as Siegfried Braune can tell you. But the story of Miamitown is the story of any organized rural fire department. Its basic ingredient is citizens like Siegfried Braune who *get to thinking.*

Types of Rural Units

Organized farm fire protection is handled in many different ways. If, as in Miamitown, the township's fire apparatus is inadequate, farmers can subscribe to a fund to buy modern equipment, then make arrangements for a centrally-located fire department to man and operate it. Under this arrangement, subscribers are furnished protection for the life of their fire truck, or in some cases they pay a small annual fee to be applied against renewal of parts or of the whole truck as the needs arise. Non-subscribers get their fires extinguished all right, but they also get a bill for the services of the truck and the firemen.

Iowa farmers organize and manage their own fire fighting apparatus. Only about 25 per cent of rural fire protection in Iowa is paid for by taxation, although it is allowable by law. Half of Iowa fire protection is provided by equipment bought by associations of farmers who leave it for the village to house and man and use for fighting town fires. The farmers usually provide the manpower for fighting fires on their own farms.

To buy modern fire apparatus, the Roland, Iowa, Volunteer Fire Department (Roland has a population of just under 800) sold shares in its fire equipment to the farmers in the fire protection district of about six miles radius around the town and firehouse. Farmers who own shares in the equipment are served without charge while non-shareholders are charged a per run fee by the shareholders for the use of the service.

The Brockport, New York, Fire Department offers a further example of association-owned equipment. Brockport's 153 volunteers are divided into five companies. Each company owns a fire truck, keeps it supplied with tires, oil, gas, battery and extra equipment, and maintains it in ready-to-roll order. The Village of Brockport rents these five units for $350 each a year. Two other towns in the Brockport fire protection district pay $50 per run for the use of a truck and volunteers. Progressive Brockport's trucks are all equipped with radio and are in constant communication with the master station at the firehouse. Brockport can send two pumper trucks to any rural fire. At the fire, a chief and two assistant officers direct the activities of on-the-spot volunteers who come to help. Brockport, a village of about 3,600, pays its fire chief $150 a year and raises fire department money through taxation plus an annual carnival and door-to-door campaign.

For farm communities which lie close to a municipal, paid fire department, there is the arrangement whereby the community may buy fire protection on an annual fee basis, at so much per property or per run. Non-subscribers, those "foolish virgins" among rural inhabitants, must guarantee the payment of a comparatively large fee or else see that their fire endangers the property of a subscriber before the fire department will act for them.

The joint operation of a department, by the township and its nearest town, probably results in a more equitable spread of costs and more efficient management. Typical of such progressive township-village owned and controlled volunter departments is the Piketon, Ohio, Fire Department. Piketon (whose normal population was fewer than 800 before the transient construction workers for the AEC gaseous diffusion plant outside town formed trailer villages within the village) is well equipped for rural fire fighting with a new, 750-gallon tank truck to supplement the 1935 fire engine which goes to town fires.

Not so typical is the fact that Piketon volunteer firemen planned their own new truck, which they call Fireball, then watched over its fabrication by a local welding firm. Fireball is the result of many thoughtful trips to progressive firehouses in other and larger towns and of heads-together planning on the part of the firemen themselves. Township trustees and the village council paid for the truck, but the hose, lights, siren, resuscitator, portable pump, and the extra nozzles were all made possible by the firemen themselves.

FOR LATE ARRIVALS after an alarm, Chief Braune chalks down the location of the fire on a board outside the fire house. The firemen read it from their cars.

THIS FAMILY was lucky; fire fighters made a five mile run and were on the spot eleven minutes after the fire was reported. The roof was the important loss. Farm insurance is high, because most farm fires are total. It doesn't take long for a wooden building to go up in flames.

At the Pike County Fair each year, the firemen operate a stand and from the sale of pop, candy, tobacco, and ice cream build up a bank account which is used for new fire equipment or for benefits in case of injury or death to a fireman. Fireball cost around $7,000 instead of the estimated $10,000, because it was built in Piketon on a two-ton heavy-duty chassis.

Another type of protection, the state-delineated Rural Fire Protection District, is as impartial as taxes. California, Illinois, Michigan, New York, and Oregon have these districts, set up without reference to township borders. For example, Serena Community Fire Protection District lies in a ten-mile radius around small Serena, Illinois, and includes some 200 farms and the two towns of Serena (pop. 200) and Norway (pop. 75). Two tank trucks, one an 800-gallon-capacity truck housed in Serena and the other a 500-gallon truck in Norway, serve the community. Forty volunteers man the two trucks, and the chief, elected by the trustees, is paid $50 a month for his services. Each spring there is a fire department dance to raise money. The new, concrete-block firehouse in Serena was built with such funds. Now, progressive-minded volunteers in Serena Community are working out a radio contact system which will operate two-way between the volunteer firemen in their private cars and the chief on the fire truck.

Another alert, forward-looking fire department is that at Princeton, Illinois. Princeton, a town of 5,800, has a firehouse with all the refinements found in large cities. Two firemen, paid drivers, live at the firehouse. A crash system replaces old-time "Central," who used to be the heroine of each fire. From one control in the telephone booth at the firehouse, all 27 volunteers are alerted simultaneously by telephones ringing in their homes. By use of a secret number, five firemen can ring in on the line at once for instructions.

Some fire districts which hire municipal equipment have found ways to provide trained firefighters at rural fires. The rural district is divided into sections and farm firemen are oppointed in each section. The farm volunteers meet once a month with the city firemen to run through special drills for farm fire fighting. All apparatus is housed in the city. Two city firemen (the driver and an officer) respond to a rural alarm with the rural apparatus. The farm firemen, notified by telephone, respond directly to the fire.

Apparatus: Its Cost and Use

Costs of fire fighting apparatus vary. A department can start with a 500-GPM pumper, about 1,000 feet of 2½-inch fire hose and two nozzles, the approximate cost of which would be about $12,500. Established fire departments have a several-times larger investment in trucks, hose, sirens, fire extinguishers, lights, extra nozzles, pumps, resuscitators, etc., none of which are regarded as extra when a fireman is fighting a fire.

In a 1950 survey of the fire protection districts of Illinois, it was reported that 53 districts had purchased 58 fire trucks, at a total cost of $545,735 or about $9,409 apiece. Broken down, the figures went this way, however. Two trucks cost between

(Continued on page 82)

Chicken Paper

Here are the new, sounder credit arrangements for poultry men
Lenders are demanding more security, better management

By C. Chester Charles

MEIGS COUNTY, Ohio, doesn't look like much in the way of farming country. It juts down into the coal mining hills of West Virginia at a double bend in the Ohio, with the rough terrain on both sides of the river stretching gaunt and desolate.

But the county bank at Pomeroy is busy with the comings and goings of farm folk, and when banks are busy, somebody is making money.

"Chicken paper," says Edison Hobstetter, the Pomeroy banker. "Yes, chicken paper. That's what we call mortgages on broiler production. Without it, Meigs County would likely still be producing about 5,000 broilers as we did eighteen years ago. Six years after the new credit arrangement started, there were 5,000 sold per week. I'd say 1953 saw way over a million and half broilers sold from our local farms—and as a business it is pretty much 'on the cuff,' as you might say."

It has happened in spots all over the country, wherever a sick agriculture needed a new enterprise or a forward-looking community found credit and poultry a practical combination for local expansion. Delaware, Arkansas, Indiana, and more recently the 20 million unit Cherokee County, Georgia, section are among many areas feeding broilers on borrowed dollars. But ready money for backing is not as ready as it used to be.

Broiler loans are nothing new. Back in 1934 just about three-fourths of the growers in the important Del-Mar-Va peninsula, which furnishes dressed poultry to the metropolitan East, operated on credit. But the wartime meat shortage prompted the shot in the arm for the broiler people that only credit on a large scale could give. New feed manufacturers sprang up everywhere, or old companies added an animal feed line and they all promoted meat-bird expansion. The government encouraged it. Sales were certain, profits attractive if not exorbitant, and operating credit easily found by anybody who wanted to try a hand at raising fowl, especially broilers with four annual broods possible, each of which paid off quickly. Meat shortages and assured profit during the war created the feeling that any ribbon clerk could get himself some chickens and some credit and become a big-time operator. The foolish abuse of credit accounted for many of the empty poultry houses on the Del-Mar-Va peninsula in 1952. Poultry farms stood like crumbling ghost towns—monuments to the improper use of credit.

The ten to twelve-week feeding cycle makes the turnover of borrowed capital faster than in any other big meat line, with half of the feed investment needed only in the last few weeks of the growing period.

Edison Hobstetter was one of the many who saw from the beginning that broiler production was a natural for short-term financing. "Look what credit did for Purley Karr here in the county. He was an average farmer who worked slack seasons in public works back in 1937 when he started with a small loan to finance 800 broilers. Now he owns a good farm, has a nice dairy herd of 26 head and is equipped to handle 50,000 birds a year. The tax valuation on his land has increased four times in the past ten years due to the soil improvement poultry manure has brought. Most of his prosperity came from broiler profits. You'll find that broiler men generally expect one batch out of four to lose money. Karr hasn't lost yet, though he did no better than break even a few times. He frequently averages a pound of broiler gain on under three pounds of feed. He markets 15,000 broilers every cycle now, but he needs $12,000 for feed and chicks and incidentals every three months. We figure about 80 cents per bird to cover all expenses, with present profits averaging 10 to 20 cents. How could the average farmer swing it without credit?"

THE COST OF A SMALL FLOCK is chicken feed; fed on farm grains and table scraps, credit is rarely involved.

EIGHTY CENTS A BIRD was loaned on this big flock to cover birds, feed, brooding and labor. The flock, houses, and a dairy herd secured the loan.

What Has Credit Done?

Borrowed capital has greased the way to tremendous broiler growth. As Hobstetter recalls, the system had its beginning when a reputable raiser in Virginia faced a financial crisis and had to ask his local store to supply chicks and feed to keep him going.

(*Continued on page* 132)

IRRIGATION

Will Pay Off in the Midwest

By Grant Cannon

IN THE SPRING when you stand in the doorway and watch the rain pour down and you want to get to your plowing, and the feedlot is a sea of mud, it takes a real contrary man to think of irrigation. But when August comes and the sun glares out of a copper sky and the corn rolls up and turns brown, then you wish you had done something about water. And this same thing goes on year after year, and you ask yourself, "Will a man never learn?"

As a Midwest farmer said the other day, "If you've got the water, farming without supplemental irrigation in the corn belt is about as sensible as trying to farm without using fertilizer. And there are a lot of farmers who have the water or can develop it who haven't given irrigation a second thought. If they don't start thinking soon, they'll be out of competition, or so hemmed in with water laws, they will have twice the trouble setting up a system, for irrigation is bound to come.

"We get enough rain during the year to classify this part of the country as humid," he continued, "but, as every farmer knows, if you don't get the rain when your crops need it, you might as well be farming on the desert. We had a drought last year, yet some states had as much rain as they normally get—it was just spaced wrong. I doubt if there is more than one year out of four when the rain falls just right for growing crops."

In the Midwest irrigation pieces out short rainfall, or it fills in during the dry season when the crop is in the "money" stage. For example, corn needs 12 inches of rain from June to September to make a maximum crop. That is just the season when there is likely to be a drought. If only 6 inches fall, then irrigation would supply the lacking 6 inches. The farmer can, with irrigation, harvest a maximum crop *every* year.

A SHUT-OFF VALVE cuts water from one lateral. Other laterals take up the extra pressure while this one is moved. (Right) THIS BIG SPRINKLER waters a circle 400 feet in diameter. It throws 600 gallons a minute under 100 pounds pressure.

Supplemental sprinkler irrigation is proving to be the answer to fickle weather. The system is simple: water is pumped onto the field through pipes which can be easily moved. The sprinklers shower an inch or two of water on a strip, and then are moved down the field, a strip at a time, until the entire field is covered.

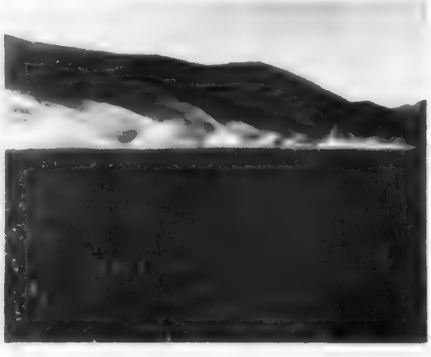
Foresighted farmers who have installed systems and have had a chance to make comparisons, say it pays off. In Tennessee, dairy farmers made a net gain of $121 in milk production per acre on irrigated over unirrigated pasture in 1951, and $110 in 1952. This is after the cost of depreciation, interest, and operating expenses of the irrigation system had been deducted. In Georgia, twice as

many steers were pastured on irrigated pastures as on rain watered land and dairy farmers were able to figure an *increase* of 4 to 7 gallons more milk per acre each day from their irrigated pastures. In Indiana, a corn farmer who has a reputation for his accurate bookkeeping, reports that his 1952 crop showed a difference of $93.00 an acre in favor of his irrigated corn after he had charged off depreciation, interest, and cost of operation of the system. South Carolina, where Clemson College is preaching supplemental irrigation with the fervor of a convert to a new religion, reports cotton yields that have been more than doubled by two applications of irrigation water to supplement the rain, and several cases of corn yields which were jumped from a puny 8 bushels an acre for unirrigated corn to anywhere from 73 bushels to 134 bushels for irrigated corn. When it comes to tobacco, a Kentucky farmer said, "Does irrigation pay? Listen to this. In three years with irrigation I've bounced my yields 400 to 700 pounds an acre more than my neighbors who don't irrigate and the price I get for my tobacco is five to ten cents a pound more than they get. Man, it's like having your acreage allotment doubled."

These reports, plus their own experience through wet and dry seasons, have convinced farmers like Tom Pottenger and his father, Meade Pottenger, who raise 125 acres of sweet corn in the valley of the Great Miami River in Ohio, that supplemental irrigation pays off. "There's no question but what an irrigation system is expensive," Pottenger said. "The system we are buying cost about as much as two good tractors, but if we'd had it last year we could have paid for it twice over from our corn alone. In average years we figure that a system will pay for itself in increased production over a period of three or four years. It could do it in two years if you get a drought."

Pottenger is fortunate in having two good sources of water supply, the river and a shallow well, each of which will produce the necessary 500 gallons per minute it will take to supply his system. With many farmers, water supply will be the most troublesome of the three important elements of an irrigation set-up—water, engineering, and equipment.

UNDER IRRIGATION, wheat has yielded 80 to 100 bushels to the acre.



A 30-FOOT PIPE weighs less than 40 pounds; even the main line can be moved in a few minutes. Water pressure seals the automatic couplings.

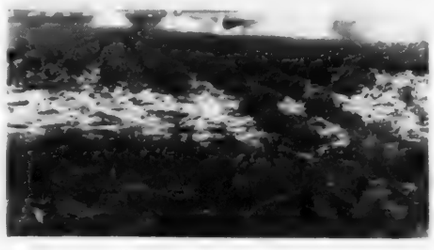
Water Supply

There are three major sources of water for irrigation: rivers and streams, lakes and ponds, and wells. Any one source may prove adequate, though some farmers have combined two or more to make out.

Where the farmer's land lies along the banks of a river he has riparian rights to the use of the water. The riparian rights (riparian means river bank) entitle him to a normal use of the water on his own land as long as his use does not interfere with the rights of others down stream. These rights are only vaguely defined by existing state laws. A farmer also has riparian rights to the use of water from a stream flowing through his farm.

A simple measurement can be made to determine the stream flow to find if he has enough water for an irrigation set-up. The measurement should always be made during the dry season to find out how much water is flowing when it really counts. To make the check, he selects a section of the stream that is uniform in width and depth and stakes off a convenient length of it. Then he measures the

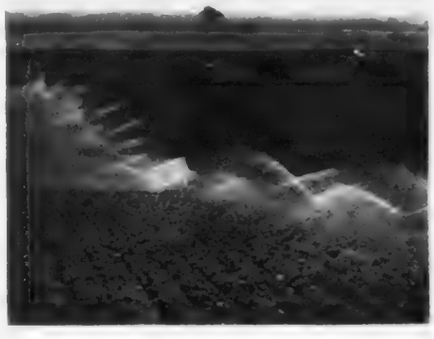
TRUCK FARMERS pioneered sprinkler irrigation to water specialized crops such as potatoes.



depth of the stream in six or seven measurements across it to arrive at an average depth. A chip is then dropped in the water at the up-stream stake and is timed until it reaches the lower stake. From these figures the volume of water flowing in the stream can be calculated. For example: 20 feet of stream is measured and staked. The average width of the stream is 10 feet and the average depth is 2 feet. The cross section of the stream is then figured at 20 square feet. A chip floated down the stream takes 10 seconds to travel the 20 feet between the stakes. The water, then, is traveling at 2 feet per second, and the volume of flow is 40 cubic feet per second. To convert cubic feet per second into gallons multiply by the conversion factor 7.5, roughly the number of gallons in a cubic foot of water. This gives the working knowledge needed—the stream flows 300 gallons per second. To reduce it to a formula you can say: width in feet times average depth in feet times velocity in feet per second equals cubic feet per second; cubic feet per second times 7.5 (7.48 if you want to be absolutely correct) equals gallons per second.

In the humid states there are about 150 sizeable streams running the year around which are large enough to irrigate the 50 million acres bordering them. At the present time less than a million acres of this land is irrigated.

NEAR SALINAS, CALIFORNIA, sprinklers supplement rain on sugar beets and lettuce.



The farmer who uses a well as the source of water has fewer guides to go by in figuring his water supply. He is not, however, completely in the dark. He can write to his State Water Resources Board or the State Water Division, as it is called in some states, and to the state office of the Ground Water Division of the United States Geological Survey, giving them the exact location of his farm and the amount of water he hopes to get from the well. These offices keep careful records of all water findings in the state and map the underground reservoirs. They can't always promise the farmer that he will surely find water at any particular spot or depth, but they can tell him what the findings in his area have been and they know when no ground water exists. They also know whether the underground water in his area is usable for irrigation or is contaminated with minerals. Other sources of information are industries in the area which are pumping ground water, other farmers, and, of course, the well drillers who are working in the neighborhood. With all the information lined up, it is still safest to drill a test well before beginning the expensive job of boring out the big 12 to 42 inch hole that will be necessary to supply sufficient water for irrigation.

On a farm which has neither stream nor well possibilities, a farm pond can sometimes provide the necessary water for irrigation. Each year as much rain water runs off an acre of ground as stays on it; your job, trap it. In some states the water that can be collected from four acres is enough to irrigate one acre. An irrigation pond, however, is a far cry from a stock watering pond. "Most farmers, I find, tend to underestimate the amount of water it will take to operate an irrigation system," Virgil Overholt, one of the country's leading pond engineers, said the other day. "An irrigation pond should be large enough to hold all the water needed during the season when it is at pool stage. We can count on rain to supply enough water to take care of pond losses due to seepage and evaporation, but we've found that it isn't safe to count on the rain refilling the pond during the summer.

"In states with 35 to 40 inches rainfall," Overholt continued, "a farmer should plan to store a minimum of five acre inches of water for each acre he plans to irrigate. If he plans to do a lot of pasture irrigation, he should up that figure." An acre foot is the amount of water it will take to cover one acre of land one foot deep; this, incidentally, is 325,850 gallons. If a farmer plans to put 5 inches of water on 50 acres of crop during the season, he will need a pond which holds 250 acre inches of water or 21 acre feet. Such a pond could be one which is 13 feet at its deepest point and covers five acres. In most ponds the average depth can be figured at one third the depth at the deepest point—this is a little on the generous side, but figuring it at one half the

A COMPLETE SYSTEM with 6-inch main line, mobile pumping unit, flexible intake pipe, 4-inch lateral pipe, couplers, and sprinkler heads is ready to move to the fields.

deepest point is too skimpy.

The farmer who already has a pond and wants to know how many acres he can irrigate, reverses the process. The surface area is measured, keeping in mind that there are 43,560 square feet in an acre, and the depth is taken at the deepest point and divided by three. Multiplying the area in acres by the average depth in feet will give the acre-feet.

In some states an irrigation pond reduces taxes. In Ohio, for example, the State will permit a farmer to deduct $40 from the assessed valuation of his farm for each acre foot of water in the pond up to 40 per cent of the valuation. The pond must have been approved, either before or after it was built, by the Division of Water. Few other water laws are on the books in the humid areas, but almost every Midwest state legislature is planning laws which will make it necessary for a farmer to petition a State Water Control Board for use of surface or underground water for irrigation.

Equipment

The old ditch and furrow method of irrigation is still occasionally used to supplement the rain in the humid part of the country, but it is getting to be as rare as a wet August. Today, almost all supplemental water is put on the crops with portable sprinkler systems. These systems are composed of a pump and a motor to run it, light weight aluminum pipe with couplers to carry the water to the field, and coupled pipe with sprinkler heads which is moved from setting to setting down the field to give full coverage.

The kind of pump will depend on the water supply. A well which requires the pump to lift the water more than 15 feet before pushing it into the pipe will call for a turbine pump; if the pump can be set near the water level where most of the work will be pushing the water rather than lifting it, a centrifugal pump will be best. The motor to operate the pump can be either an electric motor, a gasoline or LP gas engine, or a diesel. Where electric power is cheap and where the pump is to be stationary, the electric motor has the advantage of easy operation —often by remote control—very low upkeep, and maximum efficiency. One of the drawbacks of an electric motor is that many electric companies charge a minimum fee for every month of the year when they put in the power lines for the motor which, of course, jumps the cost of operation. Where gasoline or diesel engines are used they are often connected to the pump with a direct drive and the whole unit mounted on wheels to make it possible to move them from one water source to another. Most irrigation men figure that the cost of a rugged diesel is not justified unless there are to be at least 1,000 hours of pumping for the season.

Some farmers are powering their pumps with the power take-off of the tractor, but since irrigation usually calls for all-day pumping and often every-day pumping, this is tying up a tractor to do the work of an industrial engine, which costs less.

TOM POTTENGER fits a tall riser onto a lateral pipe. The sprinkler must be high to spray over the top of sweet corn.

The size and horsepower of the pumping unit should be closely geared to the amount of water to be pushed through the lines. This is one case where overdoing it just to be on the safe side doesn't pay off. An engine and pump which are too small for the job can be an awful pain in the pocketbook, but a pumping unit that is way too big is like using a dray horse to pull a sulky.

The light but very strong aluminum pipe that is being manufactured today makes the old-time irrigators, who remember the galvanized iron pipe, say, "Boy, you should have been with us when it was rough. In the old days it used to take two of us to wrestle around a section of main line—now we send a high-school kid out and he'll pick up two sections at a time without uncoupling them." The weight of the pipe without the fittings runs from 7 pounds for a 20 foot section of 2 inch pipe to 27 pounds for 6 inch pipe. Pipe comes in 2 inch, 2½ inch, and at 1 inch jumps from 3 to 10 inches in diameter. The usual lengths are 20, 30, and 40 feet.

Almost all the pipe in use today is manufactured either by the Aluminum Company of America or Reynolds Metals Company, though at least two other companies have announced their intention of getting into this field. The couplings, valves, and sprinkler head attachments are manufactured by a number of different companies and a farmer would do well to see several of them to find the one he feels is most convenient for him to operate. Fittings are the key to the easy operation of a portable system. The couplings are designed for quick, one-man fastening with a rubber seal to prevent leaks, but with sufficient play so that the pipe can follow the contour of the land.

The sprinklers themselves turn slowly, either a full turn or a half circle, and usually spray two jets of water over the crop. They range in size from small models which throw about two gallons a minute to jumbo types which shoot some 600 gallons a minute over an area 400 feet in diameter. The type of sprinkler to use will depend on the crop, the soil conditions, area of coverage, wind, time of coverage, available labor, and certainly on the type of pump and size of pipe that is used.

Engineering

You can't go out and buy an irrigation system like you can a tractor. The average farmer cannot hope to do his own engineering. He can get some help from his state extension people, but most of them will tell him frankly that his best source of help in engineering a system comes from the distributors who sell complete systems. These companies have been hiring

(*Continued on page* 108)

THE SCREENED INTAKE is pulled from an ice-crusted pond by Bo Strassel who irrigated his truck farm into the late fall of a dry year. A good crop of late greens paid him for his efforts.

COURT of the WATERS

By R. J. McGinnis

ABOVE: The defendant carries his case to his friends in the market place. They may sympathize, but the verdict is final and binding. BELOW: Leveling a flooded rice field. The Court has been settling water disputes for 800 years. RIGHT: A witness called before the Court; the crowd, silent champion of the truth, presses near. Two judges are absent.

THURSDAY is market day in Valencia, Spain, and the city is full of country people who have brought in their vegetables and fowls. It is about noon time, the edge is off the buying, and many of them have strolled through the narrow streets to the Plaza de la Constitucion, where the Court of the Waters is in session.

The accused and the accuser stand before the seven judges. Each has stated his case—there is a short deliberation and the verdict is given. It is brief, final, and there is no appeal—"Turn off his water."

This is the *Tribunal de Aguas,* the Tribunal of the Waters, one of the oldest courts in the world. The Tribunal dates back to the Moorish occupation of Spain, and its medieval simplicity and honesty has come down, for more than 800 years, almost unchanged. It has neither lawyers nor fees; it has no records and no police officers to enforce its judgments; and there is no appeal. The Tribunal meets every Thursday at 11:30 a. m. in front of the Puerta de los Apostales, the Door of the Apostles, of the cathedral of La Seo.

The Court adjusts irrigation disputes among the farmers of the great fertile plain which surrounds the city of Valencia. Rainfall here is scant, and from the very earliest times irrigation has been used in the rice fields, in the vineyards, and in the groves of oranges and lemons. The Moors planned and constructed the dams, canals, and irrigation ditches, organized the districts, and allocated water rights. These have continued almost unchanged to the present day.

From the very nature of water and its uses, disputes must be settled quickly and finally. When the regular courts, with their appeals, hairsplitting, and delays, were ready to hand down a decision, the season was over and the crop was ruined. What the farmers wanted was a court that would grind swiftly, but at the same time exceedingly fine. The Moorish government was wise and practical; it agreed, and the farmers created the Tribunal of the Waters.

Water users in the seven irrigation districts, which correspond roughly to the seven main feeder canals, each elect a judge from their own number. These seven judges elect an eighth, a President. All serve without pay. The President presides, and announces the verdict after a hearing.

The Plaza de la Constitucion is a small secluded court behind the cathedral. There are a few stone benches there and the bright, Spanish sunshine comes down gently through the plane trees and dapples the worn stone pavements. Nursemaids sometimes wheel their perambulators there and an occasional hopeful pigeon will search under the trees for bits of food. Except for the days when the Tribunal meets there, it is very quiet and peaceful.

Just before the Court is to open, a crowd begins to gather in the Plaza. A priest comes out of the Bishop's palace across the Plaza, throws the end of his cloak across his shoulders, and lights a cigarette. Two soldiers on leave stop. An old man sets his grandson on his shoulder. A verger from the cathedral brings out an iron railing which he sets up around the portal, and eight aged arm chairs, one for the president and seven for the judges, each inscribed with the name of a water district on its back. He arranges

(*Continued on page* 89)

CALF SCOURS

A calf, unlike a baby, is born without natural immunity to disease, which is why so many calves succumb to scours within the first few days of their lives. A human baby gets from its mother the antibodies which protect it from many of the germs it will encounter before it is born. A calf gets these antibodies *after* it is born, in the colostrum, the first milk a cow gives after calving. During the first 24 to 72 hours after birth, nature has provided that the delicate membranes of the calf's gut are open to absorb these antibodies. If the calf fails to get colostrum, or if it doesn't get the colostrum during the time it can absorb the antibodies, or if the colostrum is deficient in these protective proteins which immunize the calf, it will most likely come down with fatal scours or with severe scours which will reduce its vigor and leave it susceptible to late scours.

White scours is the common name for this diarrhea which usually strikes within the first three days of a calf's life and often makes a second attack a week or two later. Still later a calf may come down with scours caused by coccidiosis or by such parasities as nematodes and roundworms. But these later scours are a different problem: it is the virulent diarrhea which a calf gets in the first two weeks that is the killer.

The devastation caused by white scours to the dairy industry—it is generally credited with being second only to the packing house in killing cattle—has brought about a flood of research on the cause of the disease, and its prevention, and changed our methods of treatment from old superstitious practices such as rubbing ashes under the calf's tail or feeding it raw eggs, to the use of sulpha drugs and antibiotics.

One of the classic studies of scours was made in 1922 by America's great pathologist, the late Theobald Smith, whose work on Texas fever and bovine and human tuberculosis placed him among the top medical scientists of the world.

Smith hit at the root of the problem with an experiment in which he attempted to raise calves in ideal surroundings, but without colostrum. Of the 12 calves, 9 died of scours, one was killed when 27 days old and was found to harbor many bacteria in its organs, one had joint troubles, and the last one had rhinitis. Ten calves which were used as a control and were fed colostrum all survived. The calves which died all showed large numbers of colon bacteria in their livers, spleen and kidneys, and also showed the minute hemorrhages in various organs which are common to new-born calves.

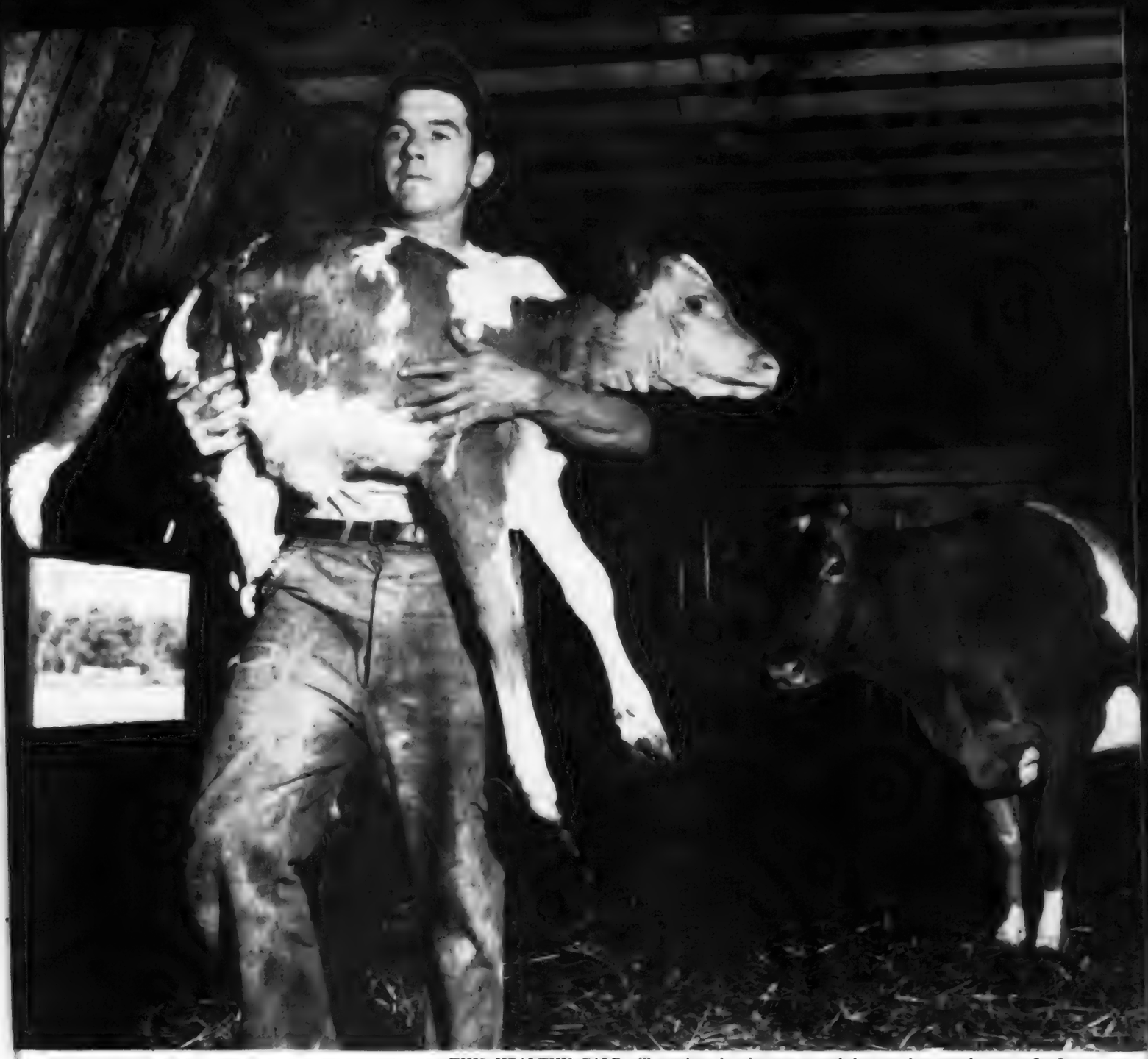
In drawing conclusions from this experiment, Smith said: "The calf deprived of colostrum lacks something which permits intestinal bacteria to invade the body and multiply in the various organs. The rapidity and duration of this multiplication determine the fate of the calf. In most cases a rapidly fatal septicemia is the result." He then warned: "It is not claimed as a result of these experiments that all colostrum-fed calves will resist the various forms of disease described, for we know that they prevail in spite of normal feeding at birth."

OVERFEEDING aggravates scours. Start feeding 2 per cent of the calf's weight and build up to 7 per cent at 10 days of age.

Today, some scientists believe that the bacteria which Smith found in the organs of his scours-killed calves come after the calf has been invaded by a virus which is too small to be seen under the microscope. Other investigators feel that the bacteria come first and the virus does its dirty work later. The fact that white scours are controllable with antibiotics, which have only a limited effect against viruses, suggests that colon bacteria are actually the cause of death. The practical diaryman may take an academic interest in this argument, but his main concern is to protect his calves against either enemy.

Preventing Scours

The first step in fighting scours comes before the calf is born by feeding the cow properly and insuring that she is dried off six to eight weeks before calving. This gives the cow a chance to build up her reserves and will influence the quality and quantity of the colostrum which she will be able to produce when the calf is born. Calving should take place in a clean, isolated pen and the calf should be encouraged to nurse immediately so that it will get the all-important colostrum in frequent small amounts while it can still rapidly absorb the antibodies. Short, frequent feeding is important, since over-feeding puts a heavy burden on the calf's digestive system and makes matters worse if the calf *does* scour. Some farmers put a muzzle on the calf to control its nursing and to prevent it from eating dirty straw. Ideally, calves should drink no more than two per cent of their bodily weight in milk the first two days, and build up gradually to seven per



THIS HEALTHY CALF will continue its vigorous growth because it escaped scours. Its first two days of nursing gave it the colostrum which contained the antibodies it needed to fight the disease. To supplement the colostrum or substitute for it, a new scours preventive, made of dried blood serum, is now on the market.

cent of their weight by the tenth day.

As soon after birth as possible the farmer should squeeze all of the fluid out of the umbilical cord and dip the cord in tincture of iodine. This helps prevent infection from entering the body through the navel.

If the calf is born during the cold months it should be taken from the cow, usually at the end of the second day, and put in a clean, warm, well drained calf pen which has a floor of fresh sand or good, clean straw. Here it should be fed from sterilized buckets and clean utensils to prevent, as far as possible, its getting contaminated material. As it grows older it will develop its own immunity to the germs it must live with.

During mild weather, a good practice is to let the cow have her calf in a clean paddock away from the herd. When the calf is taken from the cow it is put in an individual, movable pen which can be moved at least once a week to clean ground. This system has worked well in preventing both the early scours and the later ones caused by parasites.

These are the normal sanitary precautions a farmer can take and they are important. A study of scours made by Cornell University showed that under good feeding and management conditions from 14 to 19 per cent of the calves developed scours, but few died; under fair management, around 37 per cent came down with scours, and a greater number died; and under conditions which were described as poor, 46 per cent of the calves, almost half of them, had scours and the death rate was high.

Preventive medicine such as prophylactic doses of sulpha drugs and antibiotics are also being tried as a means of preventing scours. Sulphathalidine and sulphaguanidine have both been used for this purpose. The usual dose is four grams twice daily for the first three days and two grams twice daily for the next two days. Calves which have been given this preventive treatment have resisted the disease or have been able to throw it off better than untreated animals. Aureomycin and terramycin have also been found to inhibit scours if they are given within a few hours after birth. This discovery was made by scientists who were trying to find out

(*Continued on page* 128)

How to Switch Grains in Feeding

Table 1. Rates of Substitution and Usual Method of Preparing Grain for Feeding Livestock. Comparison is on a pound for pound basis.

	Dairy Cows	Fattening Beef Cattle	Fattening Hogs	Fattening Lambs
Corn	Grind.[1]	Grind if cattle not followed by hogs.	Do not grind.	Do not grind.
Wheat	Grind. Is equal to corn when no more than 30 to 50 percent of the grain in the ration.	Grind. Is worth 100 to 105 percent of shelled corn when no more than 50 percent of the grain in the ration.	Ground wheat is worth 100 to 105 percent of shelled corn.	Do not grind. Is worth 83 to 85 percent of corn.
Barley	Grind. Is equal to corn.	Grind. Is worth 88 to 90 percent of corn.	Grind. Is worth 85 to 91 percent of corn.	Do not grind. Is worth 85 to 95 percent of corn.
Milo	Grind. Is equal to corn.	Grind. Is worth from 90 to 95 percent of corn.	Grind. If hand fed, is worth 90 percent of corn.	Do not grind. Is equal to corn.
Oats	Grind. Is worth 90 to 95 percent of ground corn. If used to add bulk to ration, may equal corn.	Grind. Best used as starter. Worth 85 percent of corn if no more than 50 percent of grain in the ration. Is worth as much as 90 percent if is no more than 30 percent of grain in the ration.	Grind. Is equal to corn when no more than 25 percent of the grain in the ration. If over 40 percent but not more than 60 percent of grain in the ration, is worth only about 85 percent of corn.	Do not grind. As a starter is equal to corn during first 30 days on feed if lambs weigh under 55 pounds. For heavier weights on feed, oats are worth 80 to 90 percent of corn.

[1] Includes crushed and rolled, or other treatment which breaks the outer coating of the seed.

Table 2. Relative Feeding Values of a Pound of Grain. These values were used in the preparation of the scales on the opposite page.

Grain	Kind of Livestock			
	Dairy Cows	Fattening Beef Cattle	Fattening Hogs	Fattening Lambs
Corn	100	100	100	100
Wheat	100	105	105	85
Barley	100	88	91	87
Sorghum	100	92	88	100
Oats	95	85	85	80

BECAUSE of the wheat acreage quotas this coming season, a good many acres of American farm land will be planted to other grains, most of which will wind up, sooner or later, in the feed box. If you have been feeding corn and want to switch to one of the other grains, you not only have a feeding problem, but you also have a problem in arithmetic.

For example, market price of corn is based on a 56-pound bushel, wheat on a 60-pound bushel, barley on a 48-pound bushel, oats on a 32-pound bushel, and grain sorghum on the hundred-weight or a 56-pound bushel. Another factor that further complicates the arithmetic is that the various grains have a different feeding value for dairy cattle, beef cattle, hogs, and sheep, and also different values at different ages and weights. For example, a pound of grain sorghum is equal to a pound of corn when fed to dairy cows, but only 90 percent of corn when fed to hogs. Oats is equal to corn during the first 30 days when fed to lambs weighing less than 55 pounds, but when the lambs go on full feed, it is worth only 80 percent of corn. Then, too, the prices slide up and down and what may make a good substitute for corn today, when it is selling for $1.60, may be a poor one in terms of price tomorrow when the price drops to $1.50.

What this country has needed for a long time, in addition to a good 5-cent cigar, is a scale that gives the answer to all feed substitution problems in one quick operation. Such a scale has been prepared by Professors L. W. Schruber and R. E. Clifton, of the Kansas Agricultural Experiment Station. All you need is fairly good eyesight and a straight edge.

HOW TO USE THE SCALES: You are feeding dairy cows and you are going to buy grain. A neighbor offers you corn at $1.60 delivered; a trucker offers you grain sorghum at $2.60 per 100 lbs., delivered. Which is the better buy? (1) On the dairy cow scale read over on the corn line to $1.60. (2) Place a ruler vertical to this line so that the price on the sorghum line can be read; it will be about $2.85. This means that sorghum grain is worth about $2.85 per hundred pounds when corn is $1.60 per bushel. If sorghum can be bought at a lower price (than $2.85) it will be the more economical grain to buy. The same method may be followed when comparing prices of other feed grains or when feeding other kinds of livestock.

Use this scale when feeding DAIRY COWS

Price (in dollars) of:															
Corn, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
Wheat, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
Barley, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40		
Sorghum, per cwt.	0	.20	.40	.60	.80	1.00	1.40	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00
Oats, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40							

Use this scale when fattening BEEF CATTLE

Price (in dollars) of:															
Corn, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
Wheat, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
Barley, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00				
Sorghum, per cwt.	0	.20	.40	.60	.80	1.00	1.40	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60
Oats, per bu.	0	.20	.40	.60	.80	1.00	1.20								

Use this scale when fattening HOGS

Price (in dollars) of:															
Corn, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
Wheat, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
Barley, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00				
Sorghum, per cwt.	0	.20	.40	.60	.80	1.00	1.40	1.80	2.20	2.60	3.00	3.40	3.80	4.20	
Oats, per bu.	0	.20	.40	.60	.80	1.00	1.20								

Use this scale when fattening LAMBS

Price (in dollars) of:															
Corn, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
Wheat, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40		
Barley, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00				
Sorghum, per cwt.	0	.20	.40	.60	.80	1.00	1.40	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00
Oats, per bu.	0	.20	.40	.60	.80	1.00	1.20	1.40							

These values were computed from the relative feeding values shown in Table 2 on page 10 and are in accordance with feeding value. It is assumed that grains will be of average quality and will be properly prepared and fed in a balanced ration.

The Night Riders

Thirty years before AAA, Kentucky & Tennessee terrorists forced tobacco acreage controls on reluctant neighbors

By Charles R. Koch

SHORTLY before one o'clock on a March morning in 1908, the tenants on George Graddy's Daytonia Stock Farm, "just a piece out the pike" from Versailles, Kentucky, were awakened by gunfire. Some fifty masked riders had set fire to one of the big tobacco barns and were galloping around raising a ruckus before taking off for their next victim. Mixing discretion with courage, the tenants kept to their houses till the masked band had ridden off; then, finding the telephone lines cut, one of them hurried into Versailles to tell Mr. Graddy that the Night Riders had paid him a visit.

Such scenes were common in Kentucky and northern Tennessee during those early years of the century. The price of tobacco had dropped far below the cost of production and groups of growers bent upon bringing it back to a profitable level were attempting to enforce the same kind of program finally resorted to by the federal government in similar circumstances twenty-five years later—production controls.

These self-imposed restrictions were even more drastic than anything ever attempted by the AAA. The year 1908 is still known in the burley district of Kentucky as the year of "the cutout." The object was not merely to reduce the size of the crop, but to eliminate it entirely that year.

Graddy was one who did not see eye to eye with the groups demanding "no crop in 1908" and his barn burning came as a warning of more dire penalties that would be meted out by the Night Riders if he persisted in his plans to conduct business as usual in his tobacco fields.

From Graddy's place the Riders went on to the neighboring farms of John Harris and Mrs. Elizabeth Pepper, burning their way into the headlines. The *Lexington Herald* recorded their visit with a streamer:

LAW IS MOCKED, PEACE IS BROKEN AND THE BLUE GRASS REGION A SCENE OF DISORDER

A box in this same story served notice of Graddy's determination to accept the challenge—"I will raise tobacco in 1908. If my tenants won't do it, I shall hire men by the day to cultivate the plants and others to protect the crop at night. George C. Graddy."

Mrs. Pepper ran up the white flag—"For the sake of peace I wish to announce that there will be no tobacco raised on the Pepper Farm in 1908."

Graddy not only rebuilt his barn but surrounded it with home-made land mines to blast trespassing raiders into Kingdom Come. Alas, Graddy's hogs got there first—they rooted around the barn and the mines made quick sausage of them.

Why the Night Riders

The Night Riders conducted one of the most vicious, destructive, and bloody campaigns ever waged by American farmers to achieve "parity" for their product.

Tobacco was a crop that the early settlers found uniquely adapted to the climate and soils of Kentucky. It has been raised there continuously since the time Boone led his companions through Cumberland Gap to settle its rough hills and fertile valleys. For a century the planters grew and marketed their tobacco with only the vagaries of the weather and the ordinary fluctuations of the market to bother them. The work was hard, with the plant beds and fields demanding constant attention from the time the beds were burned off in late winter till the crop was housed early in the fall: then came the season of curing, stripping, prizing and selling. Often before one crop was sold it was time to burn the beds for the next one. The income was steady, even though the price seldom rose over ten or twelve cents a pound. A man made out even if he got as little as seven cents for his crop.

Then around 1890 the currents and pressures of the economic atmosphere began to build dark clouds above the tobacco fields. The price began to slip, settling finally at about four cents, two cents a pound beneath the estimated cost of production. To make matters worse, there was a federal tax of six cents a pound on cured tobacco in its natural state. This prevented the grower selling direct to the consumer.

The drop in price was not caused by over-production or poor quality. What had happened was that the American Tobacco Company had destroyed or absorbed just about all of its competitors. It had become a full-fledged trust with almost complete control over the market. There were only two other buyers of any size in the field—the Imperial Tobacco Company, which bought tobacco for export to Britain, and the Regie agents, who purchased for the nations of continental Europe in which tobacco was a government monopoly and a lucrative source of revenue. Imperial and Regie were said to be in tacit alliance on price fixing with the American Tobacco Company, commonly spoken of as "The Trust."

The big tobacco manufacturers had apparently been behind the passage of the six cents tax law, which forced the farmer out of the consumer market. Although the law had been passed as far back as 1872 and modified in 1890, it was not until 1897 that it was fully enforced.

The modern looseleaf auction market was practically unknown in those days. The farmer either prized his crop in hogsheads and took it to a warehouse where it was sampled and sold, sometimes at auction, sometimes privately, or he sold it to a buyer who came to his farm and inspected the tobacco in the barn. Many preferred to sell this way, for, if the first buyer didn't offer enough, there would always be another along.

But the Trust turned barn buying to its own advantage. It split the tobacco region into districts and assigned only one buyer to a district. The buyer would visit a farm and offer his price on a take it or leave it basis. If the farmer declined the deal, he was visited by no other buyers and if he went out in search of the original bidder he almost invariably found himself offered an even worse deal than the original one.

This was the situation throughout the central Kentucky burley belt and the dark tobacco belt—the Black Patch, as it was called—of western Kentucky and northern Tennessee, in the early 1900's.

The Protective Association

The growers were in a predicament. And as usually happens in such circumstances, they grumbled a good deal, but for a long time did little or nothing. But the crisis was acute, and in September, 1904, there was organized at Guthrie, Kentucky, the *Dark Tobacco District Planters' Protective Association of Kentucky and Tennessee,* with one Charles H. Fort, a planter of Robertson County, Tennessee, president, and Felix G. Ewing, another Robertson County planter, and the man who had contributed most to the conception of the organization, general manager.

The basic idea of the Planters' Protective Association was to fight monopoly with monopoly. If the growers were to be forced to sell their product to one buyer, the Association would organize the Black Patch growers into a tight pool and force the Trust to buy from one seller,

"O, Fool, Raise No Tobacco"

NOTICE—Oh, fool: Dare to raise a stalk of tobacco on your land or assist any one else in the raising and ye shall pay the penalty with your home and life. So be ye warned.

"NIGHT RIDERS."

NO IDLE threat, this notice tacked on a gatepost. The gun, torch and mule whip were typical Night Rider weapons.

THE MILITIA tried hard, but were generally ineffective. While they guarded this tobacco barn in northern Kentucky, a dozen others went up in smoke.

the Association. The idea was simple and direct. It had only one flaw—the perversity of human nature.

While there was an immediate rush of farmers to join up, there was the inevitable group of lone wolves who refused for one reason or another to put their names on the line and pledge their crops to the Association. Had they done so, there would have been no Night Riders.

The Association attempted to get eight cents a pound for the part of the 1904 crop that was pledged to it, twice the price the grower had received the year before. But the Trust would have nothing to do with the young organization, permitting its buyers to pay ten and twelve cents to the outsiders, soon to be called Hill Billies, rather than come to terms. This was bitter medicine for the Association members. They were getting nothing while the Hill Billies were cleaning up. Finally, late in the spring of 1905, the Association was able to dispose of all of its tobacco on the export market at an average of 6.67 cents.

The Association handled about 35,000 hogsheads of the 1905 crop, approximately 10,000 more than it had sold the year before, but at an increase of less than half cent a pound in price. The Hill Billies, meanwhile, were continuing to get up to twelve cents for their tobacco, cash on the barrel head, and a considerable number of Association members violated their pledges in favor of these enticing prices and ready cash.

To stop the pledge jumpers, suit was brought against a number of violators. The Tennessee judge who heard the cases, though, ruled that the Association was merely acting as agent for the members and could not force them to deliver their tobacco to it. This was a serious blow, since it came at a time when the Association had decided to write its pledges on a three-year basis.

A good many individuals in the Black Patch had by this time come to the conclusion that if the Planters' Association was to accomplish its purpose, some kind of drastic action would have to be taken. Some of the more impatient ones had already scraped a few Hill Billy plant beds, burned some barns, threatened Trust buyers, and wrecked a warehouse or two.

Then in October, 1905, violence moved into high gear with the publication of the "Resolutions of the Committee of Thirty-two of the 'Possum Hunters Organization." These resolutions indicted the Trust for the hard times in the tobacco region, sharply criticized all citizens of the district who did not give the Planters' Association their full support, and resolved that a "committee of not less than 5 nor more than 2000 members visit each farmer who is not a member and offer him an opportunity to become a member". Committees of 2000 never expect to take "no" for an answer and are seldom adverse to using arguments stronger than mere oratory.

Within a few months the first lodges of Night Riders came into existence on the Kentucky-Tennessee border. Known to the elect as The Silent Brigade and having no official connection with the Planters' Association, the organization was set up on military lines. At the top was a general and under him was a lieutenant commander. Each county was under the leadership of a colonel and the elected head of the individual lodge had the title of captain. The captain appointed lieutenants to assist him. None but members knew the identity of these officials, though it was later revealed that the general was Dr. David A. Amoss, of Cobb, Kentucky, and that Guy S. Dunning, of Wallonia, Kentucky, was the lieutenant commander.

The Riders had an elaborate system of signs, passwords, and challenges; their meetings were secret; they had no costumes of any sort, though they usually wore masks on their raids; and upon initiation they subscribed to a solemn oath, the violation of which was to be punished with death and burial in an unmarked grave. They held regular meetings and were drilled in military formations. All were mounted on good horses or mules.

CENTRAL KENTUCKY farmers were urged "to use very little fertilizer and a great many Gatling guns" to grow a tobacco crop in 1908. This grim militia gun crew protected the contents of a warehouse at Lexington.

Princeton Raided

The early forays of the Night Riders were more or less mild—plant bed scrapings, barn burnings, and whippings. But by December, 1906, they were prepared to show the world that they were about to launch a total war. In August, certain New York insurance companies had received unsigned warnings that the John Orr tobacco factory and the Stegar and Dollar factory at Princeton, Kentucky, were going to be put out of business. Shortly after midnight of December 1, the threat became a reality. Two hundred

(*Continued on page* 94)

Prof. FLINT'S HORSE AND CATTLE RENOVATING POWDERS

For COUGHS, HEAVES, EPIZOOTIC, PINK-EYE, HIDE-BOUND, ROUGH COAT, Etc., THEY HAVE NO EQUAL.

THE MEDICINE MAN

On a ledge behind the horse stalls, along with the currycomb and brush, grandfather kept an assortment of bottled goods bought from peddlers. These peddlers drove about the country, making regular calls. Those that represented the larger patent medicine houses generally had a bright red or yellow buggy and a spanking team of horses. Others carried a variety of salves, ointments, elixirs, and liniments in a suitcase and got about in a hired rig from the livery stable in the village. They were personable characters with what was known as "the gift of gab", and they could smell a chicken dinner for miles.

One of the stand-bys on the ledge was Sloan's Liniment. Grandpa wouldn't have thought of farming without a bottle of this marvelous panacea. Let a bump, swelling, cut, bruise, spavin, fistula, or sprain appear on a horse, and grandpa brought out the Sloan's. He didn't hesitate to use it on himself or the hired man. It was, and is, a potent concoction, and applied to the bare skin was a counterirritant powerful enough to make you forget anything less than a compound fracture.

Sloan's Liniment was for the exterior surfaces of man and beast. There were other and equally universal remedies for the inner ills and pains of livestock. The label said a dose would cure colic, scours, bloat, abortion, and constipation. They were effective, too, in relieving undiagnosed ills commonly referred to in humans as the miseries, but in animals as the epizootic.

Regardless of what the label on the bottle or the gay posters hanging in the blacksmith shop said, grandfather wouldn't buy until he had snifted the contents. If his snifter made him reel and raised his hat off his head, then it must be good. If it wasn't more than a dollar he bought it.

Veterinarians were scarce and poorly trained and not very popular. Grandfather preferred to make his own diagnoses and do his own doctoring. If, by *(Continued on page 82)*

IN broad strokes of color Spring brings her blossoms to a climax with whole hillsides of flowering fruit trees.

DOG TOOTH VIOLET likes the leaf-carpeted hillsides. It is one of our most beautiful wildflowers.

COLUMBINE in its wild state, brings a flaming area of color to shady spots.

The Flowers of Spring

By Samuel H. Gottscho

When the spring sun warms the hillsides it is pleasant to sit down-wind from an orchard in bloom and breathe the laden air. The high-pitched hum of the bees as they go about their work of pollination is music to the farmer's ears, for it is a prediction of abundant harvests to come.

An orchard in flower is a bold gesture of nature. To see some of her shyer blossoms we must go into the deep woods. There, in spring, when wild flowers are at their best, you are surrounded by the sounds and smells of the earth coming back to life. If the day is still you can hear the dry leaves stir and rustle as the Jack-in-the-Pulpit and the Dog Tooth Violet push their green shoots upward.

Only a few generations ago our country was all like this, a land of forests and swamps broken only by the treeless prairies. In the shade of the forests grew many beautiful wild flowers; in the swamps flourished bog-loving plants, among them some of our native orchids, cousins of the exotic greenhouse species, which have become big business.

When the Europeans arrived here they were amazed at the

DUTCHMAN'S breeches is a light and humorous touch of nature.

WILD GERANIUM flowers are a delicate patch of color in the midst of large, ornate leaves.

THE MOCCASIN FLOWER likes the acid soil of pine and oak woods.
Just to be sure it will be seen it hangs its flowers like jack-o-lanterns on graceful pikes.

abundance and variety of our wild flowers. The English, in particular, sent over plant collectors to take back to their country specimens of our native plants which are now honored occupants of their gardens. Even today they are still developing some of our goldenrods and use them as accents in garden borders.

With the settling of our country came the need for fields and pastures to grow our grain and feed our cattle and horses. Our woodlands were pastured, destroying the wildflowers. Forests were cut down and swamps drained and filled. Farmland replaced wilderness and crops and livestock prospered. Wild plants disappeared because their woods and swamps had been destroyed. As towns and cities developed and population increased, more and more wild areas fell victim to the march of progress.

In recent years this encroachment upon our woodlands has alarmed those who like unspoiled nature. Today there are numerous organizations devoted to the preservation of our vanishing wildlife. Nature and wild flower sanctuaries have been established in many sections of the country.

Without any great effort, a farmer's wife can take under her protection a small piece of woodland, perhaps only a quarter of an acre, and bring to life the native wild flowers of her part of the country. If she chooses a spot near the edge of the woods which is near the house and can prevail upon her husband to fence it against the intrusion of cattle and rabbits, she will have an excellent location for her wild garden. In fact, nature will have started it for her with the wild flowers that already grow there. Not only can she watch over these, but, keeping in mind the terrain of her woodlot, she can plant new species.

In general, woodland areas can be divided into two types, the first, open, dry, rocky woods and wooded hillsides; the second, cool, shaded, deep and damp woodland. Both types of terrain are liked by many species of flowering plants and shrubs. Woodlands of the first type are good locations for Rue Anemone, Wood Anemone, Hepatica, Spring Beauty, Early Saxifrage, Columbine, Foamflower, Yellow Violet, Lousewort, Dutchman's Breeches, Squirrel Corn, Pipsissewa, Spotted Wintergreen, Round-leaved Pyrola, Pink Lady's Slipper also known as the Moccasin Flower and Trailing Arbutus. The last two wild flowers are particularly fond of pine and oak woods where the Mountain Laurel grows.

Wild flowers which prefer the second type of woodland are Jack-in-the-Pulpit, Wild Geranium, Bellwort, Yellow Clintonia, Canada Mayflower, Indian Cucumber Root, Yellow Lady's Slipper, Partridge Berry, Wake Robin or Red Trillium, Showy Orchis, Wild Ginger, Red Baneberry, White Baneberry, Bloodroot, Fawn Lily or Dog Tooth Violet, Cut-leaved Toothwort, Crinkleroot or Two-leaved Toothwort, Herb Robert, Sweet White Violet, Wild Sarsaparilla, Bunchberry, Twinflower and Wintergreen. The last three favor evergreen woodlands in mountainous regions and are frequently found growing together.

These are the descriptive and colorful names our early settlers gave native plants. In the variety of blooms and leaves the plants are rugged individualists, too.

AS if drawn by Greek artist the Jack-in-the-Pulpit is decorated with a series of flowing white lines on the deep green of the bloom.

After the type of woodland terrain has been determined and a section of the woodlot chosen for the wild garden, it is a good idea to check the species already growing there against the list of those that could grow there. Rarely, if ever, does a limited stretch of woodland contain all the species of wildflowers possible to grow on it. Nearly all the missing ones can be brought in from other parts of the woodlot or from a friend's property. Sometimes, due to road building or other construction, certain plants are marked for destruction. Saving these from the jaws of the bulldozer will increase the population of the wild garden and serve the interests of conservation as well.

Preparing the woodlot for a wild garden requires very little time and effort. No extensive clean-up of the ground is necessary. Some of the dead wood and underbrush can be removed, but the surface of the ground should not be disturbed by rake or hoe.

(Continued on page 100)

By Fred Knoop

Lifetime Fences

New Tools and New Wood Preservatives Have Made Good Fencing Faster To Build But It's Still Hard Work

FENCE BUILDING has changed in the last ten years—for the better. A tractor-mounted post hole digger will sink a 3-foot hole in a couple of minutes; a hydraulic post driver carried back of a tractor will put a sharpened 8-foot wood post deep in the ground, ready for the wire, in five minutes; a new type steel corner post can be put in the ground, given a twist to expand the anchor, the two 90 degree brace posts driven in the ground and bolted to the corner post, the whole stretching has been made easier, too; quick-clamping stretchers do most of the work that used to be done by the farmer's back.

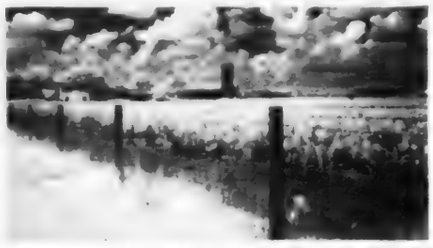
Through the years the U. S. Patent Office has recorded a procession of patents on fencing and the tools to erect it. Basically, all of these ideas were aimed at making fencing easier and faster, and therefore cheaper. Many patents have added years to the life of fence. It's still a great field for inventors, for containing herds and flocks and marking boundary lines is a problem as old as farming.

In 1867 Alfonso Dabb was granted patent 63482 on "a picketed wrought iron strip," the first of hundreds for barbed wire. This was one of the turning points in agricultural history, for this was the wire that broke the plains, that changed the whole farming picture from the Mississippi westward. It was in DeKalb, Illinois, that barbed wire patents began to spring up like mushrooms. Here, on the edge of the great prairie, the need for fencing could be seen. If a homesteader wanted to safeguard his crops from hungry, marauding mavericks he had to have fences. Board and picket fence had cost a settler about $300 a mile. That had discouraged homesteaders. Then the new wire changed the whole picture; for $150 a mile they could put up a three-strand barb wire fence.

The successful patents of J. F. Glidden, a DeKalb farmer, and Jacob Haish, a lumber dealer, both used a twisted pair of wires to hold the barbs; their patents made them rich; the West was changed from ranches to farms. In 1886 a rancher in Dodge City complained: "The large stock ranges of Kansas have all been settled by hardy sons of toil, and the ranchman is obliged to move westward to some other country which is yet unsought for by the immigrant of the East."

Good Fence Costs Less

Like an insurance salesman, the man selling fence and posts today will base his costs on a "cost per year." This is a good way to look at fence costs for, if it costs $5.00 a rod to build the best 47-inch stock fence which will last for more than 20 years and, contrasted to this, you can only cut your fencing cost down to $4.00 a rod by using a light weight fence that is good for 10 years, it isn't difficult to see that good materials are the cheapest part of the operation. Today, the labor required to erect a fence (this does not include cutting posts or hauling materials to the job) will average from ½ to ⅔ of the total fence cost. The method of construction is the same for cheap materials as for the best, so every farmer can let his pocketbook be his guide. Art Marvin of Coldwater, Michigan, has these thoughts on the subject. He says: "Fencing is something that shouldn't happen to any man but once in his lifetime—so I want the best wire, the hardest posts and the deepest holes for the fence we put in this spring."



THIS 16 YEAR OLD boundary line fence was built near Midland, Kansas. The posts are 4-inch round pine, 7 feet long, and were pressure creosoted. It looks good enough to last another 20 years.

If a farm is being laid out for fences for the first time the owner has a chance to do a fine arranging job, free of buildings, lanes and prejudices. The chances are he is not going to be that lucky, but in any case there are basic rules to follow:

1. Keep the fields as big as possible. (This saves fence, dead corners in plowing, etc.)
2. A long field is more desirable than a square one. (The tractor rows can be longer and easier to cultivate and harvest.)
3. Arrange the farm so it can be pastured without using long lanes. (Make a accurate drawing of all the fields on the farm and put an evening's effort in laying out fences and fields to try to eliminate lanes. It's as good a puzzle as you'll find, and a lot more profitable.)
4. Try to enclose soils that dry out at approximately the same time inside the same fence in the same field. (This allows plowing, cultivation and harvesting to go forward at the same time.)

How Much Wire?

For a single stretch of wire you will need the following amounts to fence these various acreage:

160	acres	640	rods
80	"	480	"
40	"	320	"
20	"	240	"
10	"	160	"
5	"	120	"

If the fence is to be topped with two strands of barbed wire fence you will need double this number of rods in barbed wire rolls.

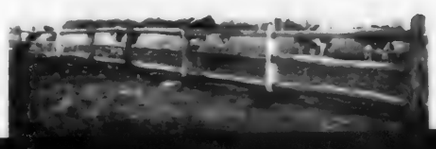
How Many Posts?

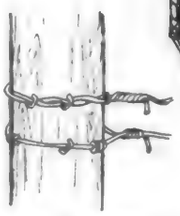
Line posts are spaced 12 to 16½ feet apart, varying with the soil. Used on a contour the posts may need to be closer than the one rod spacing that is much used in the Midwest. Wooden line posts should be set 2½ feet deep and steel posts are driven 2½ feet deep. On long, straight

(Text continued on page 68)

STEEL POSTS and woven wire topped with barbed wire is an easy-to-build farm fence. Below, Spence Roberts, Jr., a Paris, Kentucky, fence contractor, uses a wire twisting machine to fasten the wire to braces and posts of the stock fence he specializes in building.

THE POST-AND-RAIL was one of the fences the early settlers built. Today, it can be purchased ready to install. When it is cut from hardwood it is long-lived and requires no maintenance.

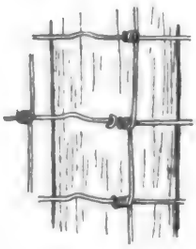




START the fence by removing several spacer wires and using the free ends to wrap around the corner post. Then splice the wires back to themselves.

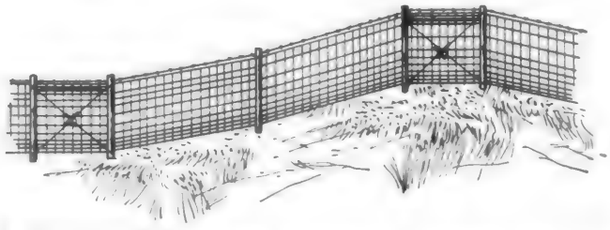
GROUNDING is necessary with any wire fence. Steel posts take care of this. If only wooden posts are being used an 8-ft. steel post should be driven in the ground at least every 40 rods and secured to the fence.

TENSION CURVES are put in fencing at the factory as shown in the top wire. When the wire is properly stretched, the tension curve is reduced to about ½ its original size, as shown in bottom wire.

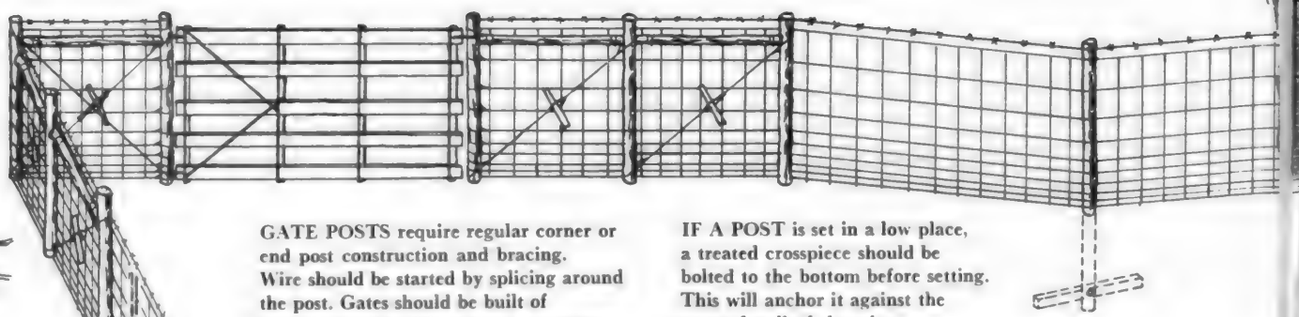


STAPLES should be galvanized and 1½ inches long. They will hold better if set diagonally so that both points do not enter the same wood grain. On line posts, they should never be driven so tight that they clamp the wire to the post. The natural flexing of the fence with heat and cold should not be restricted.

BRACE WIRES used on corner, end, and stretcher posts should be 4 strands of No. 9 galvanized wire. Use a strong piece of wood for a lever and leave it in place for future use.



ROUGH GROUND requires frequent use of stretcher posts. These should be 8 ft. long and 5 in. in diameter. Sink brace posts far enough apart so that a line post can be used as a horizontal. They are notched, braced and wired.



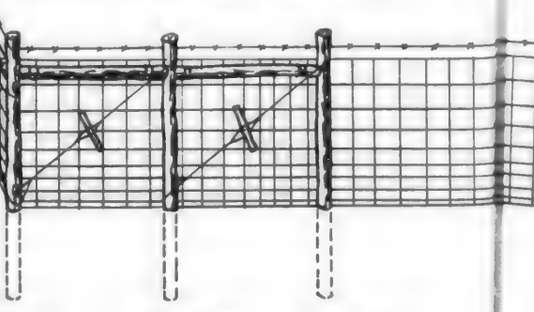
GATE POSTS require regular corner or end post construction and bracing. Wire should be started by splicing around the post. Gates should be built of lumber treated with creosote or penta so they will last as long as the fence.

IF A POST is set in a low place, a treated crosspiece should be bolted to the bottom before setting. This will anchor it against the upward pull of the wire.

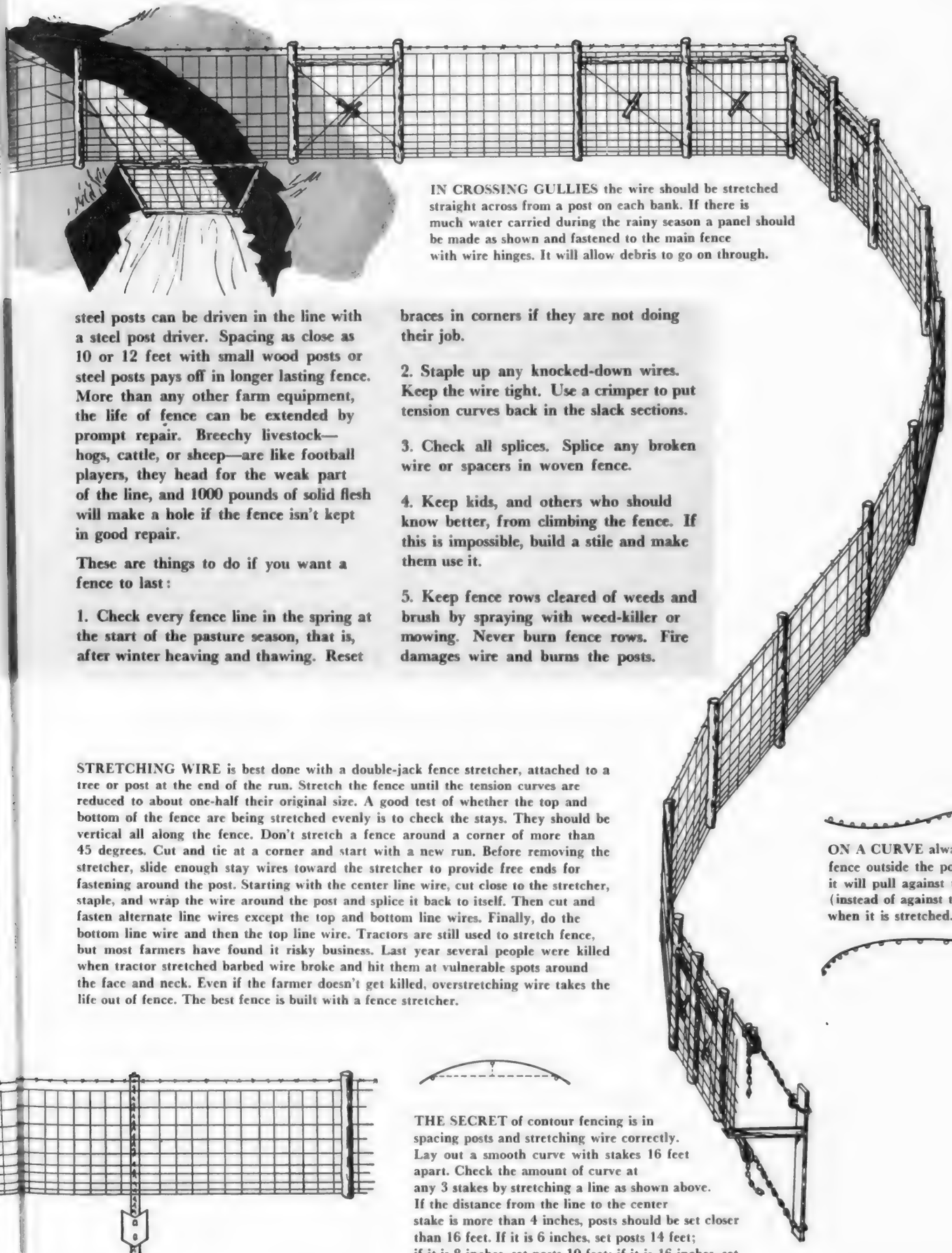
These are construction problems you'll have in fencing a farm.

BEFORE starting fence building, clear the line of weeds, sprouts, brush and animals. A roll of barbed wire can be used to make the line for post hole digging. Dig or drill the holes a few inches back so as to avoid knocking the wire out of line. This guide wire can later become one of the wires in the fence. In the Midwest, one rod spacing between big line posts is standard practice. There is a new idea in fencing, though, that makes good sense, that is to put more posts in the line and use smaller posts. With pressure treated posts, using either penta or creosote, a 2½-inch line wooden post is good for many years of service. These small posts can be set easily, or driven, in many types of soil. Standard

CORNER POSTS and end posts are dug and braced the same. Metal corner posts are available in 7½ to 9 ft. sizes, which are usually set in concrete. American Steel and Wire Company supplies an expanding anchor dirt set corner post which needs only to be turned to become firmly anchored in the ground. Wooden corner posts should be at least 8 feet long and 6 inches in diameter. The corner post should be sunk 3½ feet. Brace posts may be slightly smaller, say 5 inches, but are set as deep, and far enough apart so that a horizontal can be made from a line post. Old timers cut mortises in the brace post to hold the horizontal in place. A newer method is to use a ¼-inch pipe as a "dowel," boring holes of the same size in the brace posts and the horizontals, and then fitting them together.



Corner Post | First Brace Post | Second Brace Post



IN CROSSING GULLIES the wire should be stretched straight across from a post on each bank. If there is much water carried during the rainy season a panel should be made as shown and fastened to the main fence with wire hinges. It will allow debris to go on through.

steel posts can be driven in the line with a steel post driver. Spacing as close as 10 or 12 feet with small wood posts or steel posts pays off in longer lasting fence. More than any other farm equipment, the life of fence can be extended by prompt repair. Breechy livestock—hogs, cattle, or sheep—are like football players, they head for the weak part of the line, and 1000 pounds of solid flesh will make a hole if the fence isn't kept in good repair.

These are things to do if you want a fence to last:

1. Check every fence line in the spring at the start of the pasture season, that is, after winter heaving and thawing. Reset braces in corners if they are not doing their job.

2. Staple up any knocked-down wires. Keep the wire tight. Use a crimper to put tension curves back in the slack sections.

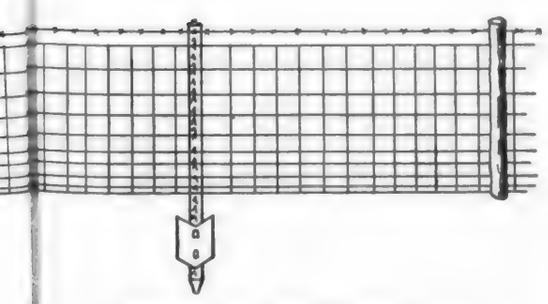
3. Check all splices. Splice any broken wire or spacers in woven fence.

4. Keep kids, and others who should know better, from climbing the fence. If this is impossible, build a stile and make them use it.

5. Keep fence rows cleared of weeds and brush by spraying with weed-killer or mowing. Never burn fence rows. Fire damages wire and burns the posts.

STRETCHING WIRE is best done with a double-jack fence stretcher, attached to a tree or post at the end of the run. Stretch the fence until the tension curves are reduced to about one-half their original size. A good test of whether the top and bottom of the fence are being stretched evenly is to check the stays. They should be vertical all along the fence. Don't stretch a fence around a corner of more than 45 degrees. Cut and tie at a corner and start with a new run. Before removing the stretcher, slide enough stay wires toward the stretcher to provide free ends for fastening around the post. Starting with the center line wire, cut close to the stretcher, staple, and wrap the wire around the post and splice it back to itself. Then cut and fasten alternate line wires except the top and bottom line wires. Finally, do the bottom line wire and then the top line wire. Tractors are still used to stretch fence, but most farmers have found it risky business. Last year several people were killed when tractor stretched barbed wire broke and hit them at vulnerable spots around the face and neck. Even if the farmer doesn't get killed, overstretching wire takes the life out of fence. The best fence is built with a fence stretcher.

ON A CURVE always put the fence outside the posts so it will pull against the posts (instead of against the staples) when it is stretched.



Steel fence posts should be driven 2½ to 3 feet in ground.

THE SECRET of contour fencing is in spacing posts and stretching wire correctly. Lay out a smooth curve with stakes 16 feet apart. Check the amount of curve at any 3 stakes by stretching a line as shown above. If the distance from the line to the center stake is more than 4 inches, posts should be set closer than 16 feet. If it is 6 inches, set posts 14 feet; if it is 8 inches, set posts 10 feet; if it is 16 inches, set posts 8 feet. Set posts so they lean toward the outside of the curve. Put only about half as much stretch on contour fencing as on line fence.

PEELING POSTS is many a farm boy's first taste of fencing. You need only two strong arms and a drawknife, and it lengthens the post's life by years.

A POSTDRIVER works like a miniature pile driver. It sinks a post, ready for the wire, in less than five minutes in most Midwest soils.

THE STRETCHER POST, or corner post, made of steel is quick to put in place and the braces are driven in the ground at the anchors, as shown above.

BETTER MOUSETRAPS have been invented and finally a better staple for fencing has turned up, under the name of "Stronghold." This "L" shaped staple can be handled by a man who has only two hands. You start the staple by holding it with one hand and hammering with the other. Then the wire can be hooked over the open side of the staple. While stretching the wire with one hand the staple can be driven home. The threaded shank keeps the staple from working out of the post, and this feature is especially useful in treated posts, where the oil in the post greases the way for the exit of the ordinary staple.

stretches of fence—of 80 rods or more—it is a good idea to install a corner-sized post in the line—complete with braces—every 40 rods.

Line posts should be 4 to 8 inches in diameter and 7 to 8 feet in length. There will be variations from these average dimensions in different parts of the country.

The Corner Post

If you ask a dozen farmers how to set corner posts you'll likely turn up with a dozen good answers. The old timers will say "Cut them big; set them deep, and brace them with big deadmen." In case you're not acquainted with a fence builder's "deadmen" you'll discover after placing a couple of them that it is the digger not the buried 3-foot post that best fits this name! A deadman is set 3 feet deep and 3 feet back of a corner post on the extension of the line of each brace post (see page 156). A single braced corner tied into well-anchored deadmen is almost as good as a double-braced corner. It's not as popular with fence builders though, for deadmen sunk deep in the ground leave little to show for all the hard work involved. Corner posts should be 8 inches by at least 8½ feet long and should be set not less than 3½ feet in tamped earth. If rocky ground prevents going deeper than 3 feet, concrete should be poured around the base.

To Treat Or Not

"Treated posts," says Spence Roberts, Jr., the busiest fence contractor in the Blue Grass Region of Kentucky, "used to be mostly for looks. Today our customers want them to be either creosote-treated or penta-treated for long life. This part of Kentucky here around Paris has always been strong for black painted barns and posts. It sorta goes with tobacco, beef cattle and race horses. Penta is new but it makes a pine post that's nice and clean to handle, and Government tests show it will last a long time. Creosote posts have been used around here for as long as I can remember. My Daddy works with me on the contract jobs and often we've got to replace some creosote-treated posts that he put in 25 or 30 years ago. 'Durn, crazy drivers can't keep on the road,' he says as he picks up some of those posts that have been knocked out by cars on their way to Florida on Route 27."

Creosote has been used for preserving wood for railroad ties and telephone poles for over fifty years. With pressure methods of forcing the creosote into the wood, fence posts last 30 years or more even in hot, humid parts of the country where they are most subject to insect damage and rot.

"Penta"—a short name for pentachlorophenol—is a powerful wood preservative that has become very popular during the last 10 years. For the best results it should be applied to posts under pressure. However, since it is mixed with light oil, it may be made up into a 5 per cent solution on the farm and the peeled posts treated in 55-gallon drums.

Steel Posts

In much of the country the freight rates have made the handling and shipping of posts an important part of their cost. Through much of the corn belt, within easy shipping distance of the steel mills in Chicago, the steel post is the best buy. The heavy duty steel line post will cost between 75 cents and 95 cents in 7-foot lengths and a steel corner post with braces will cost $6.00 to $8.00. Wooden posts cannot compete with these prices because the wooden post producing areas are great distances away. As far as the lasting qualities of steel posts are concerned they can stand up and take it. Steel posts are easy to drive with the pipe shaped post driver that is supplied for this purpose. In moist ground a post can be driven in, ready for the wire, in 3 to 5 minutes. In fencing with steel posts clips are used to fasten the fence wire to the post. For temporary pastures the steel fence post is to be preferred for it is much easier to move. Even in wood post country there is a trend toward using a metal post for every other line post. This saves time and does cut down on the fencing cost if wooden posts must be bought off the farm.

What Kind of Wire

Many different types of fencing materials are available to meet varying farm requirements. Farm and poultry fences differ as to height, spacing of line and stay wires, and gauges of wire. Designation of the various styles in the form of style numbers has been standardized by manufacturers for convenience. These style numbers indi-

(Continued on page 153)

A CORNER POST, with anchor lugs, should be firmly set with rocks tamped in above the lugs.

THIS IS the business end of a post-hole digger turning up the last six inches of dirt in a three-foot hole. It takes three minutes to sink the hole—and just about as long to move on to the next digging.

WHEN BRACED with steel braces this kind of corner will stand almost any pull.

THE FINAL RESULT is neat and long-lasting.

Is Now the Time to Start in Sheep?

A new wool tariff, low animal population, and less competition point to an upswing in the sheep business

Is now the time to go into sheep? In February, 1953, this question was asked of sheepmen, rangemen, purebred breeders, livestock commissionmen, meat packers, and market experts. They shook their heads: they didn't say "No" and they didn't say "Yes." They all agreed that the future looked hazy.

That same question was asked again in February, 1954. In spite of the fact that sheep, along with cattle and hogs, are off in price, and the sheep population is way down, the answer was a very definite "Yes." From where they sit, these men say, there is nothing in the outlook but good in the years to come.

Some of them believe this on the old theory that the time to get into a business is when it is low—it can't go anywhere but up: and when many sheepmen are quitting because of low meat and wool prices, sheep numbers will drop still lower and prices will go up because there will be short supply. These men point out also that right now a foundation flock can be established at a relatively low cost, and feed prices will be no higher. And it still holds good that for a quick, profitable return on investment, sheep top the field.

Every market analyst shows concern that sheep are at their lowest numbers in this country since before the Civil War. It makes a farmer wonder if the laws of supply and demand aren't causing it. Maybe people won't buy mutton. Maybe wool substitutes are wiping out the wool market. Perhaps there are fewer sheep because there is no profit in sheep. That's what you might think.

But here are the facts:

There were 56 million sheep in the U. S. in 1942. They fell off to 29 million in 1950, an all time low for 86 years of record. During the next two years, numbers increased slightly, then dropped back to 32 million in 1953. This year the total will drop back further, though some farm-flock states show a moderate increase.

The causes are many. Declining profits in sheep *have* worked to reduce their numbers. But this is a single factor and one that may soon reverse itself. There is no chance in sight, however, for overproduction of lambs or wool.

Fewer sheep are allowed access to public grazing in the west. High labor costs of good shepherds and reluctance of younger men to accept range life have discouraged sheep raising in the northwest. Cattle profits a few years ago prompted the increase of beef herds at the expense of range sheep. The Midwest and the Southwest cut their sheep herds in the last two or three years because of drought, especially in Texas, our leading sheep state. Until recently high dairy profits encouraged dairy expansion in the north central states, where sheep numbers also declined. In all parts of the country breeding ewes went to market in 1953, which means fewer lambs this year.

A FARMER can go into sheep today with little capital—good breeding ewes are priced low.. We'll always use wool (right) and higher tariff protection is predicted for the near future.

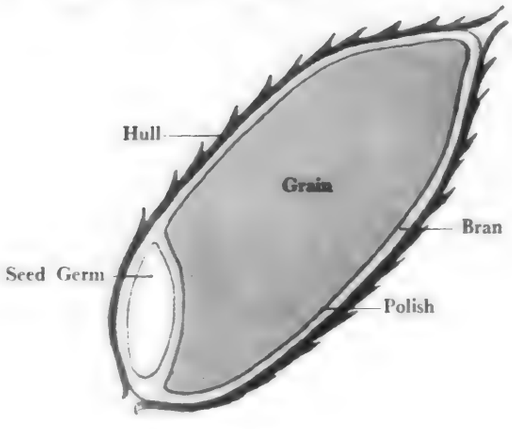
Wool Prices and Production

The wool situation has caused discouragement everywhere in the nation, but has brought the greatest liquidation in the western states where wool breeds predominate. In 1952, the average net income on large sheep ranches of the northern plains was $6,000, which is only one-third of the average net income of 1951, and is the lowest since 1949. Incomplete reports for 1953 indicate still further reduction in average incomes among sheep ranches.

Many small flock owners of wool breeds of sheep went out of business back at the time when the profit in sheep turned from wool to meat. Wool represents 50 to 60 per cent of the income from the fine wool breeds of the western range flocks, wherein during dry-year feed shortages ewes are sometimes left unbred but prove profitable from wool income alone. But of the so-

(*Continued on page* 119)

Rice



America grows her own and exports 850,000 tons a year.

LAST FALL a delegation of rice growers from Siam came to the Arkansas Rice Branch Experiment Station at Stuttgart. Since Siam is the world's leading exporter of rice, it might have been assumed that these gentlemen had been called in to give the benefit of their experience to American growers. Such was definitely not the case. Actually, they came to study American methods and see how they could be adapted to conditions in their native land. For the United States is the most efficient rice producer in the world. Only Siam and Burma surpass this country in rice exports.

Though most Americans look upon rice as an Oriental crop, its history in this country is as long as that of most of our more common crops. It made its appearance first in South Carolina about 1685. After the Civil War production shifted from the east coast to the bayou country of Louisiana; today the leading rice states are Arkansas, Louisiana, Texas, and California, with Mississippi coming up fast in the field.

In other parts of the world, particularly the Orient, rice is produced with a maximum of human labor and a minimum of mechanical equipment. The land is usually prepared with a simple wooden plow pulled by water buffalo or by man, sometimes both, hitched together. A heavy log is dragged over the ground to level it. The seed is sown broadcast and tramped into the mud, or else sprouted in flooded seed beds and transplanted by hand. The fields are irrigated by foot-power pumps, and weeding is a job for men, women and children who laboriously wade through the paddies. Harvesting is done entirely with hand tools. The crop is dried in the sun and threshed by pounding the heads across logs, driving cattle over them or by a variety of other methods, all equally extravagant in their use of human or animal muscle.

In the United States there is little backache in the rice fields. In eastern Arkansas, the Grand Prairie area, rice is grown by typically American methods. Here two man-days per year will produce an acre of grain; the world average is 200 man-days per year. Each man on an Arkansas rice farm is backed up with something like $13,000 worth of equipment, exclusive of the investment in wells and pumps.

Rice came into Arkansas in 1904. A year or two before that one William H. Fuller, of Lonoke County, went down into the rice regions of Louisiana to do a little hunting and escape the monotony of season after season of unprofitable farming on his flat, water-logged land. He came home with one of the biggest bags ever brought out of Louisiana—the idea of raising rice. He talked his friends and neighbors into financing a well and pump, sowed 70 acres of rice and in the fall of 1904 reaped a neat little harvest of 75 bushels per acre. In 1953, Arkansas' crop of 486,000 acres of rice yielded 26 million bushels (a 54 bushel per acre state average), and brought her farmers an income of $59 million. Yields of 60 to 65 bushels per acre are generally considered satisfactory; the basic support price for long grain rice last year was $2.30 per bushel.

Meet a Rice Grower

Paul Wallworth, a man with the lean, weatherbeaten look of the farmer, the precise speech of an engineer, and the business acumen of a banker, is one of the veterans of the Grand Prairie. Like most of his neighbors, he is a Northerner by birth. Rice attracted him from his native Wisconsin to the vicinity of Stuttgart shortly before World War I. Today he farms 1740 acres, of which 800 to 950 are in rice. In 1952 he sold 92,000 bushels from less than 900 acres of riceland. His ultimate aim, he says, is 300 bushels per acre. He has 12 tractors—two of them crawlers of the largest type. To harvest his crop he has five, twelve-foot, self-propelled combines, the special rice field kind, with extra heavy frame and huge tires to keep them from bogging down. The riceman runs his combines in the water if his fields haven't dried in time, and up and over the scores of levees that interlace the fields.

Besides his tractors and combines, Wallworth has a huge 40-foot land leveler, suspended on a frame that looks something like a truss bridge, six or eight smaller levelers, a fleet of disc and spring tooth harrows, and other items of equipment too numerous to list.

Rice has a thirst like a fog-bound skipper and Wallworth is well prepared to keep it completely under the influence of its favorite beverage, water. "We just barely squeeked by the last two summers," he says, "so I decided I was going to make sure we'd have all the water we need next year. We put down an 800-foot well with a pump that will deliver 3000 gallons per minute from now until Doom's Day. The well and pump cost $28,780 without the engine. It's going to take 200 horsepower to deliver the goods, but when I want water, I want water and I don't want to fool around."

This and another well and a 330-acre reservoir of an average depth of 10 feet, supply the water on the Wallworth farm. There are almost three miles of canal to carry the water to the fields, and several relift pumps to boost it from lower to higher levels or back into the reservoir when the fields are drained.

Water is the critical element in rice production. The crop can be grown on almost any kind of soil as long as it is underlain with an impervious hardpan that will hold the water. Its chief climatic requirement is a mean temperature of 70 degrees during the 120 to 175 days of its growth period. But without plenty of water to flood the fields there can be no rice.

Ralph King, chief engineer of the Layne-Arkansas Company, at Stuttgart, is the Grand Prairie's personification of Jupiter Pluvius. Layne-Arkansas drills wells and installs pumps and King is the man who plans and supervises the installations and sees that they stay in good shape. King is an early riser: he goes down to the City Cafe at five o'clock spring and summer mornings to breakfast with the boys. If there is any pump trouble reported, he dispatches his repair crews on the double.

HEADS OF RICE ready for harvest (above). The combine (opposite page) has almost eliminated the threshing machine from American rice fields. With its extra heavy frame and wide tread tires it rolls over the levees and through wet fields.

He raises some rice of his own, too, and he knows right down to the last drop how much water it takes to make a crop. "A well and pump that will deliver 500 gallons a minute is all a man needs for 100 acres of rice—if he's careful with it," is his opinion. Most rice growers don't feel safe with a capacity of less than 800 gallons per minute. Experiment station bulletins advise that it takes about 33 inches of water to make a crop in the Prairie section, of which about 11 inches can be expected to be supplied by rainfall during the growing season. Such an old hand as Paul Wallworth, however, uses as his rule of thumb a figure of 7 gallons of evaporation per acre per minute and figures that each acre will evaporate 26 inches of water while the crop is growing.

The point that King tries to drive home—and it may seem strange for a man whose business is installing irrigation systems—is that what most raisers need is not more water, but more water conservation. "What we have to do is hold it when we get it and use it like it was pure gold," he argues. "It's a sin to waste water."

The Rice Year

The outsider flying over the Grand Prairie in late fall is puzzled by what appear to be terraces following the contours across

fields in the most irregular and erratic fashion. At times they run so close together he's convinced they must be combine tracks rather than terraces. Then, when he lands and gets a close-up view he finds that they are actually low levees, about 12 to 16 inches high thrown up at every 2/10 foot fall in the level of the land to maintain an even level of water across the fields.

They stand out in sharp relief on the gray November days, for combining has just been completed and the rice farmer is preparing to tear them down and disc in the stubble as the first step in preparing the ground for the next crop of rice, or for winter oats. Some grow rice for two or three years or even longer: others follow a rotation of rice-oats-lespedeza; or rice-soybeans-oats-lespedeza. The lespedeza —Kobe—is generally grown for seed.

December and January are a period of comparative inactivity which the rice farmer uses to advantage in opening and cleaning his drainage ditches. Then, as the days begin to lengthen in February and the ducks that have wintered on the reservoirs leave for their summer grounds, it's time to sow lespedeza and give the oats a shot of nitrogen. It's also time to start working the rice fields. Not all use the plow, but for those who do, this is the first step in preparing the land for rice. Then the land is levelled with the big levellers and the levees are surveyed. Some farmers hire professional surveyors to run their lines, some do the job themselves: the more particular, like the Kennedy boys, buy the best transit, hire a professional to man the instrument while they carry the rod: for the rodman is the important man here. Setting the rod down on a clod or in a tiny hole can ruin a levee before it's started.

After the lines have been laid out the levees are built. This job may be done with a special levee disc, an implement that looks like an ordinary disc, except that it is high in the center; or sometimes a pusher is used—a kind of V-shaped implement open on both ends, that is pulled along the path of the levee wide end first, ridging up the dirt as it goes along.

When the levees are finished, discing and harrowing start. Some farmers go over their fields six and eight times, riding over the levees. Paul Wallworth has an arrangement that enables him to hook three, fourteen foot discs behind one of his big crawler tractors. With this outfit he "beats the field to death," as he puts it.

By this time April is on the farmer, and unless it is too wet, as it was last year, it is time for seeding. Prairie farmers say that on the twentieth of May last year they were looking disaster right straight in the eye—virtually no rice had been seeded. By September 15 they had one of the greatest crops they had ever seen—90 bushel yields were common.

A considerable amount of the seed is drilled; the end-gate seeder is used also. But the airplane is displacing both these implements. In fact, the airplane has been called the most important implement in the rice country. It is used not only for seeding rice, but for fertilizing, spraying, and for sowing lespedeza.

Seeding can be done either on dry ground or in water. Many feel that seeding in water is a fool-proof approach to guaranteeing a stand and eliminating undesirable grasses, if—and this is a must—if 2,4-D is used to control the pest the growers call "duck salad", a weed more properly called oblong-leaved mud plantain.

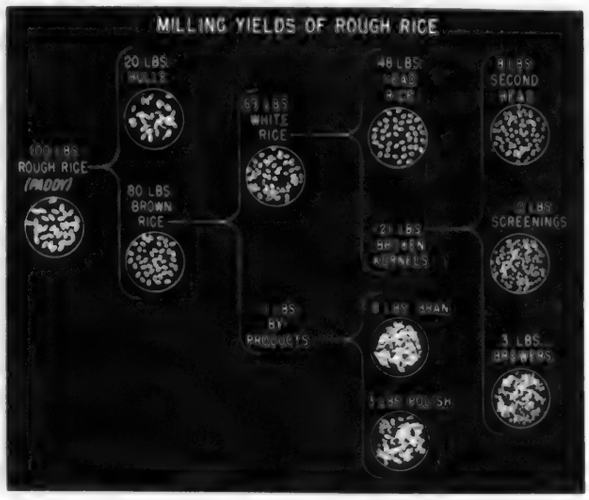
The field is gone over with a springtooth harrow just before flooding, if the seeding is to be in water. When the seed is sown it finds its way to the bottom of the trenches left by the harrow and the action of the water covers them with the dirt that has been ridged up. The rice comes up in rows as precise as if it had been drilled.

Those who plant dry usually flood their fields when the crop has had three or four weeks growth: then after another four weeks the fields are drained and the ground aereated. The water-seeded crop will usually be flooded continuously for the first eight weeks. All the time the water is on the fields the levees must be inspected daily. This is when the levee walker—that indispensable man in the hip boots with the long handle shovel on his shoulder — becomes the most important man on the farm. A crawfish may decide that a levee is just the place for a home, and sink his hole. Then a water moccasin will come along and wriggle in after Mr. Crawfish, expanding the hole as he does so. The levee is punctured and the water level starts to drop, slowly at first, then more rapidly as the break grows. Wave action, too, may damage a levee; or a pump may break down. Any of these or a score of other woes can spell disaster at a critical period.

It is June now and in some of the lower sections the roads are covered with water drained from the rice.

In July the fields are re-flooded. All during the draining period they have been

IN THE Orient rice is transplanted by hand in the mud paddy (right). An air-tourist's view of an American rice farm (below). A maze of levees maintains a constant and even water level. The diagram (below right) based on Jap, or short grain, rice, gives an idea of milling yields. The short grain mills somewhat better than the medium and long grain rice, but is not so popular with the housewife. Head rice commands the best price, followed by the second heads, screenings and brewers rice.



SEEDING RICE at the rate of 50 acres an hour. There are only three men on the job—one in the plane, the flag man under the umbrella and his counter-part at the far side of the field; a sharp pair of eyes can spot him under the tip of the left wing of the plane.

watched carefully to insure against their drying out too much.

During all of August the big crop is under water. At mid-day the blooms open and fertilization takes place. Some of the very early varieties of rice may even be harvested this month, but it is generally in September that the levee walker starts cutting the levees to drain the fields for the last time or, if the weather has been unduly dry and promises to remain so, he may simply shut off the pumps and allow the fields to dry up.

In October and early November comes harvest, the busiest days of the year. The rice is now ready for the combine. Before combines came in, about ten years ago, the rice was cut and shocked, and threshed after it had dried in the fields. The combine was not practical until driers were perfected, for moisture content of the grain is too high for storage when it is just right for the combine. The driers are huge bins into which the rice is elevated and dried by heat. The crop is combined at a moisture content of 17 to 23 per cent and the driers pull it down to 12 per cent, at which point it is in a safe condition for storage until the mill is ready to handle it. Very little rice is stored on the farms, though some farmers do have aerators in which they can hold at least part of their crop, particularly that which they are saving for seed. Practically the entire crop is harvested, dried and stored within 60 days after the combines start rolling.

Expenses

Arkansas rice farms are big. Most growers say they don't feel that it is economical to fool around with less than 240 acres. A 240 acre farm, they suggest, should have about 100 acres in rice and the balance in dry crops. Two men with $26,000 worth of equipment and some additional seasonal labor should be able to handle this setup.

Yet the little man with the know-how can do all right. Herbert Holzhauer and Wilfred Reed, who farm in partnership at Gillett, had 35 acres of rice last year. Their sales from those 35 acres grossed $8,000 and they retained about another $1,000 of seed rice, a tidy $257 per acre. Conservative estimates put the present per acre cost of rice production at about $50, exclusive of taxes and interest on investment in real estate.

One of the charges the modern rice farmer bears that was unknown to his father is for aerial services. The going rate for seeding, fertilizing and spraying by plane in the Grand Prairie section is $35 per hour. Most operators can cover in the neighborhood of 50 acres per hour, depending upon how close to the farm they can land for loading. Fifty acres *a day* is considered good with a drill.

Jim Oliver is a young rice farmer who, with a couple of partners, set up Flying Farmers, Inc., in 1948, to provide aerial services for his region. Today he and his partners fly six planes and are kept busy meeting the demands of some 250 farmer customers. His seeding business has increased 800 per cent in the past three years and his fertilizer business is up 300 per cent for the same period.

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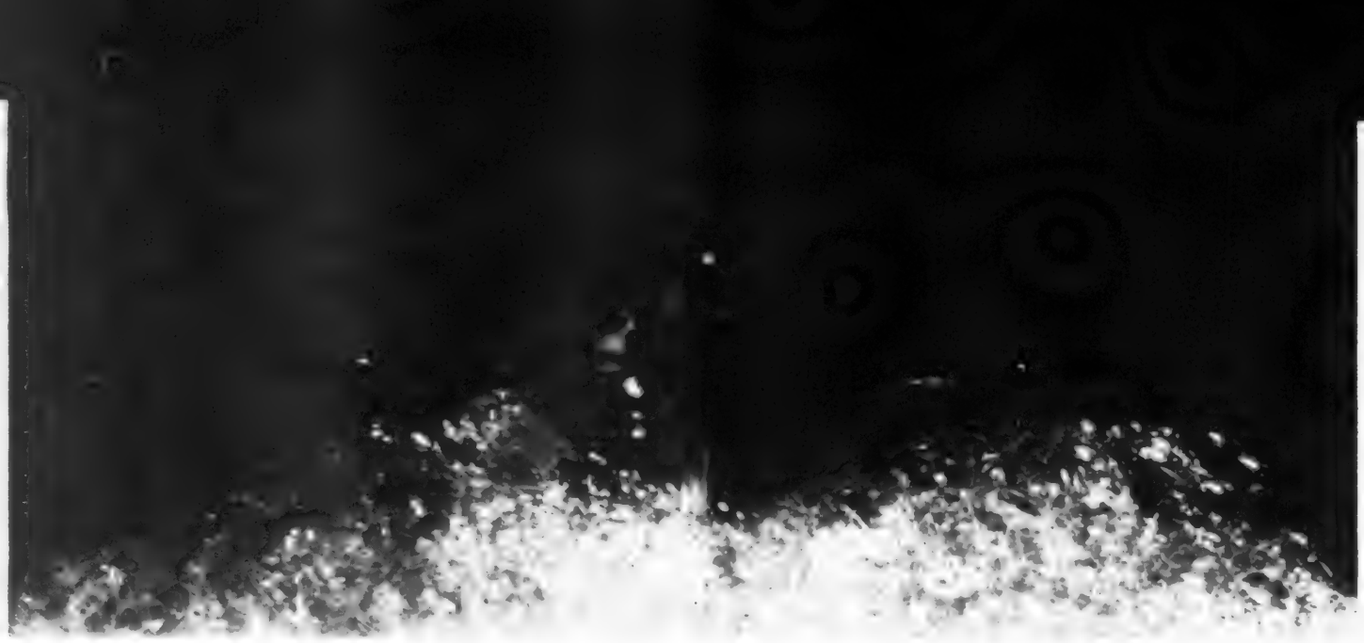


Water Softeners

Four out of five farms have a hard water problem. It causes milkstone, scale in pipes, and tattle-tale gray clothes

By Jo Ann Belle Pierce

HARD WATER is hard on everything, plumbing, clothes, dishes, hair, skin, food, and most of all on the farm wife and the pocketbook. In 85 per cent of the country, the hard water plague is almost as universal a topic as the weather, and just as Mark Twain said about the weather, "Everyone talks about it, but no one does anything about it." At least, they didn't until about three decades ago when there appeared on the market an appliance resembling a water heater which can soften the hardest water.

What Makes Water Hard?

Water straight from the heavens is usually pure and soft, but not for long. In its role of universal solvent, water quickly picks up impurities from the air and, as it runs over the surface of the ground and percolates through the rock layers, it accumulates calcium and magnesium salts.

The average farm wife recognizes hard water by the greasy, grayish curd in her dishpan, but the chemist knows it by the minerals it contains. He expresses the hardness by the grains of salts per gallon of water, or by "parts per million."

Water is considered hard for most household purposes when it has more than three grains hardness.

Just how much of these trouble-making minerals, calcium and magnesium, are present in your water—that is, just how hard your water is—can be checked through any dealer handling water softeners, or by the health department. Usually the softener manufacturers or dealers make no charge for testing your water and recommending the type of softener needed to correct hardness. If you want to check the water yourself, you may buy one of the soap test kits available for the purpose.

Hard Water Gets In Your Hair

There is a great deal of difference in the degree of hardness in water, but whether your problem is acute or mild, it is easy to spot. China and glassware are clouded, white clothes are tattle-tale gray, fabrics become rough to the touch, and your skin may become irritated; and every time you wash your hair it ends up feeling like binder twine!

In the kitchen it causes headaches, too. Tea, coffee, and vegetables lose their original taste, and peas and beans become wrinkled and tough when cooked in hard water. Utensils, especially the teakettle, become coated with scale when hard water is heated in them. This scale collects in pipes, in the boiler, in hot water radiators, in showerheads, and other fittings. Often the pipes become completely clogged and must be replaced. Collecting in the coils of your water heater, the scale causes additional expense and trouble.

Hard water can be almost as much a hindrance to the farmer as to his wife. As any milk inspector will tell you, the farmer who uses hard water in his milk house will end up with an accumulation of "milkstone" on his pails, strainer, and other equipment, the result of either milk or soap combining with the calcium and magnesium salts in hard water. Milkstone has a way of boosting the bacteria count about double what it should be. It is also difficult to make show animals look their best when they are washed in hard water. Commercial fruit growers find it hard to remove spray residue with hard water to the minimum permitted by the Department of Agriculture without destroying the natural bloom and lustre of the fruit.

Whether or not hard water in itself is unhealthful is a controversial point. Some medical men believe that hard water may contribute to such ailments as gall and kidney stones and constipation, while others contend that it is harmless. There are other ways in which hard water may be considered unhealthful.

A common unhealthful situation is the soap and calcium smudges which stay on china, glass, and silverware when they are washed in hard water. These supply a harbor for bacteria and a good environment for their growth. The common cold may spread through the family in this way. The soap curd deposited in the fabric of clothing, especially in Junior's diapers, frequently is responsible for a painful skin irritation and rash.

Water Can Cost Money

In addition to the health problem and general inefficiency in housekeeping for which hard water is responsible, there is the dollars and cents fact that hard water

costs you money each year—a lot of money.

The largest hard water waste is in the cost of soap. The cost of soap in relation to hardness looks like this:

0 grains hardness — $37 a year
10 grains hardness — $59 a year
20 grains hardness — $74 a year
30 grains hardness — $96 a year
40 grains hardness — $98 a year
50 grains hardness —$110 a year

The amount of fuel wasted through the use of hard water varies according to the length of time over which boiler scale has been forming. On the average, it is estimated that hard water causes the use of about one-third more fuel for heating water. There is also the added expense of replacing pipes as they become clogged with the collection of water minerals.

Soap curd formed by hard water is hard on fabrics, too. The curd crowds the fibers apart causing them to lose their flexibility, to become frayed and broken. Result: the life of your clothes is shortened 20 to 40 per cent. The dirty gray curd denies any reasonable amount of bleach; therefore both white and colored clothes must remain dingy and lifeless. Ironing becomes more of a chore with hard water: clothes full of soap curds are easily scorched.

Solving the Hard Water Problem

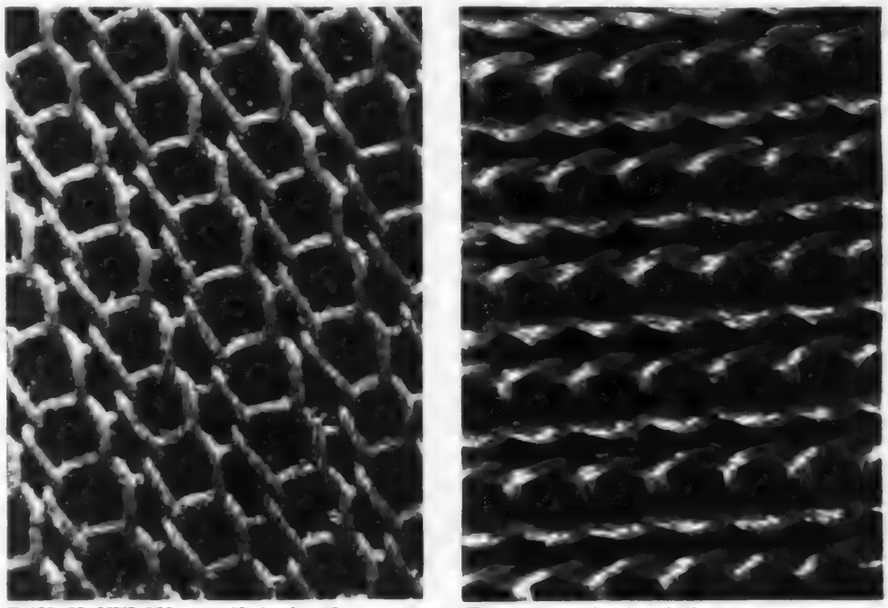
There are several ways in which this pickpocket can be foiled. Soap wastage and scum can be cut down by adding preparations such as borax, washing soda or detergents. These compounds have a definite place for clothes and dishes where a batch of zero hardness soft water is needed.

The solution for treating all of the large volume of water in a farm home is a softening unit which is connected to the main water line and removes the minerals which cause hardness from the incoming water. The process by which the unit works is really quite simple, although the almost magical ability of a softener to transform hard water into soft may sound mysterious.

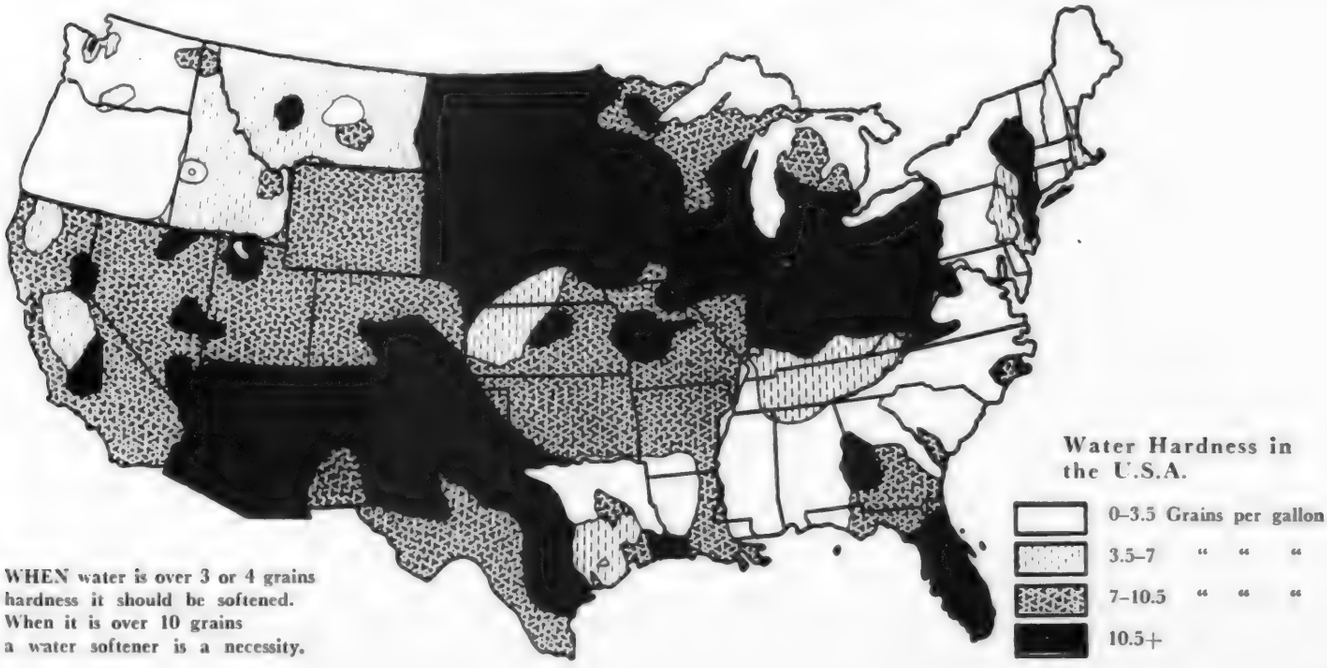
The unit is made up of one or two tanks (much like water heaters), the necessary minerals to remove hardness, and valves to control the operation of the softener. One tank of the unit contains a mineral, called an ion-exchanger, which has the ability to swap ions with other minerals. In the softeners, the ion-exchangers trade ions of sodium for the calcium and magnesium ions in the hard water. The water enters the softener containing calcium and magnesium carbonates and leaves it containing sodium bicarbonate, which is harmless.

When the ion-exchanger mineral's sodium is traded away, the exchanger loses its capacity to soften water and must be "regenerated" if it is to work efficiently. This is done simply by running a small amount of salt brine through the mineral tank. The mineral trades its calcium and magnesium ions taken from the hard water back to the salt brine for fresh sodium ions. The brine solution is flushed from the softener tank then and the unit is ready to start its regular softening cycle once more.

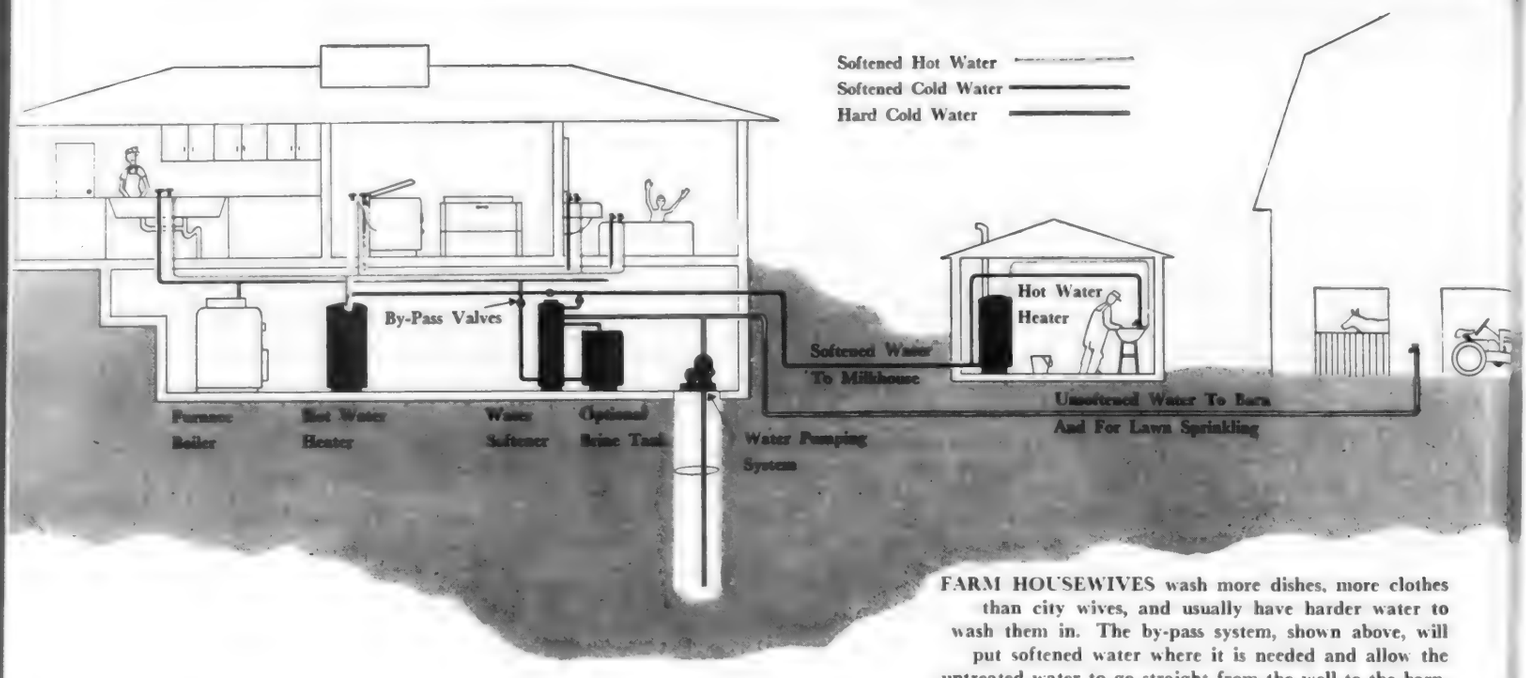
Water softener minerals, for the most part, are classed as "zeolite." There are three principal kinds of zeolite. Natural zeolite, or "green sand," the first material to be used in softeners, has little use today. It looks much like any sand except that it is greenish black in color. When stabilized with a chemical treatment and baked, it



THIS IS NYLON magnified after five washings. The soap curds are sticking to the threads on the left, washed in hard water, and the fraying and parting of fibers is apparent. Soft water, right, keeps the fiber in shining, pliable condition.



WHEN water is over 3 or 4 grains hardness it should be softened. When it is over 10 grains a water softener is a necessity.



FARM HOUSEWIVES wash more dishes, more clothes than city wives, and usually have harder water to wash them in. The by-pass system, shown above, will put softened water where it is needed and allow the untreated water to go straight from the well to the barn.

has the ability to soften water, but the capacity is low—3,000 to 5,000 grains per cubic foot.

Manufactured zeolite has supplanted the natural green sand and has been used for 20 years or more. It has about four times the capacity of the natural zeolite. Zeolite can be used successfully on most types of water.

The synthetic resins, used today as the ion-exchange mineral in many softeners, are comparatively new in the field. Chemically, they are entirely different from any of the zeolites and cannot properly be called "zeolite," although they are often referred to as the "high capacity zeolites." Actually, they are plastics made from the same group of chemicals as the polystyrene plastics, but they are a different group which has been developed as water conditioning minerals. They are recognized as being the best products of their kind and are largely supplanting the use of other minerals. Companies manufacturing these high capacity resins, which because of their capacity are making more compact softening units possible, include The Dow Chemical Company, Permutit, Rohm and Haas, and The Chemical Process Company.

Basic softener units can be counted on to remove the hardness in water as well as traces of other minerals, but for the effective removal of troublesome quantities of other minerals special adaptations of these systems must be worked out. This is true in the few areas where the water is highly acid, highly alkaline, low in silica, or contains dissolved iron, manganese, or sulphur. A method of combating both "red water," caused by iron, and corrosion is to install a filter ahead of the zeolite unit which removes some problem minerals before the water passes on to the softener.

Types of Softeners

For the home, two basic types of softeners are available today—the single tank unit, and the two-tank brine model. With the single tank unit it is necessary to put the salt required for each regeneration directly in the tank and to flush it through the softener by operating the valves by hand. This usually takes about 30 minutes of the operator's time. These units deliver water of the same softness as two-tank units and require little more than a square foot of floor space. They can be conveniently placed in the kitchen, utility room, basement or garage.

The two-tank model is made up of a mineral tank and a brine tank. Salt for several months' use can be stored in the brine tank and all that is necessary at the time of regeneration is to open the proper valves so that the salt solution may flush through the mineral tank.

For those who want the softening process as simplified as possible, there are fully automatic units. By merely setting a clock-like mechanism attached to the tank, regeneration takes place automatically on the day and hour desired. The only attention that need be given to the softener is to replenish the salt supply in the brine tank as it is needed.

Another type softener is made partially automatic with a simple patented timing valve. This softener is a single tank unit. To regenerate, salt is poured in, after which a clock-timing device is turned on. The water is again turned on. No return trip to the tank is necessary for the operator. Thirty to forty-five minutes later the brine will have passed through the unit, and soft water will again be available.

A Cistern Supplies A Little Soft Water

"When we built our new house about two years ago," says Lauren Parks of Monroe County, Michigan, "we decided that we would install a softening system. We had a cistern on the farm where I grew up and like most farm people we kept a sharp eye on the water supply. It was good, soft water, but we never had enough of it. Maybe that's one reason why I wanted to install a softening system here in connection with our well supply so that we could have plenty of the right kind of water. It makes housekeeping a hundred per cent easier for Betty, my wife, too.

"We installed a softener," Parks says, "which has a capacity of 25,000 grains. Our water supply has about 30 grains hardness. This size unit will supply us with 1,000 gallons of soft water before regeneration is necessary. There are four of us in the family, so this is about a week's supply. We felt we could install a comparatively small unit because it does regenerate automatically and doesn't require my attention often."

A heavy duty clock is attached to the Parks' unit, set to regenerate Thursdays during the early morning hours before the family gets up. This way they are never without soft water.

"The first time the softener regenerated we were pretty startled," Parks says. "The whole family was awakened way before dawn by this strange rumbling and thumping noise which turned out to be the softener. Just like city people who live near the railroad tracks and hear trains thundering through at all hours of the night, we got used to the noise and rarely notice it anymore. Cutting down this noise, though, is one improvement which could be made, in my estimation.

"There was no problem in installing the system in the house," says Parks. "We planned for it along with the rest of the plumbing when the house plans were drawn up, indicating exactly where we wanted soft water to go. We have soft water lines running to the showers and lavatories in both bathrooms, to the kitchen sink, and the laundry area in the basement. We also have one outside faucet hooked up with the soft water line so that I can give the car a final rinse with soft water when I wash it. This prevents a lot of the spotting you get with hard water.

We use hard water at all the other outlets, for drinking, and in the bathrooms to flush the water closets.

"I'm completely sold on softeners," he adds, "and with the automatic model all I have to do is add more salt when the brine tank gets low. I usually use Morton's salt pellets which are especially made for softeners. A 100-pound sack lasts about five or six weeks and costs around three cents a pound.

"We've had no difficulty with the softener in the two years it has been installed, except shortly after the house was completed. We'd just had the well dug when the house was built and I hadn't gotten the permanent cover fixed over it. One Sunday our boys and a couple of their cousins took a notion to pour sand in the well. Before I knew what had happened some of it had gotten in the softening system and clogged it up. We had to have service on it three times before it got straightened out.

"Betty still thinks cistern water is softer than our softened well water, but I argue that our water supply is a cleaner and more reliable source and we don't have to worry about hauling water from town during a dry summer," Parks says.

What Size to Buy

How often regeneration is required depends upon the size of the softener, the volume of water used by the family, and the grains of hardness of the water. It is important, most experts agree, to select a softener of a capacity which will require regeneration no oftener than every two weeks. The formula for figuring your basic softener needs is to multiply the number in the family times the amount of water each member uses, times the grains hardness of your water supply, times the number of weeks you want the unit to operate between regeneration. This figure equals the size softener you need in grains hardness it will remove between regeneration periods.

For example, if your water is 20 grains hard and there are four people in your family, figuring about 250 gallons of water per person each week for household purposes, the family would use about 1,000 gallons of water per week, or 2,000 gallons during the two weeks between regenerations. This amount multiplied by 20 grains hardness equals 40,000. This is the number of grains hardness which your softener would need to remove between regenerations and would indicate the size which you should buy. Overplanning is always a sounder practice so that there will always be a good supply of soft water, so a 45,000-grain unit would be the best buy.

If you want to regenerate less often, have a larger family, or want to use soft water outside the home for another farm use, be sure to consider these factors carefully before you buy, or you will find the softener inadequate for your needs. If you are willing to regenerate more often, you may select a small unit and save a few dollars on the initial expense.

"My advice to anyone buying a softener is never to buy a small one," says Merrill Smith, who raises hogs and does general farming near LaSalle, Michigan. "Although there are only four of us at home, we installed a 60,000-grain unit several years ago and have never been sorry we did.

"We used a softener for years at the house we lived in before we remodeled this house in 1946. The softener there was put in when the house was built in 1928. It was an old Monarch unit sold by Sears, a 20,000-grain model which we regenerated once every two or three weeks. It finally rusted out in 1944 and had to be replaced.

"Even with Mrs. Smith keeping house and washing for five people then, the 20,000-grain unit seemed to be a good size. But these days there seem to be more things to use water for and we are more conscious of having an adequate water supply, so I ordered a 60,000-grain unit to install here.

"It cost just over $100 without the brine tank. Not long ago the congregation at our church bought a softener for the parsonage which cost nearly $200, so you can see how prices have advanced in the last few years. If I hadn't done my own installing there would have been another $30 or $40 bill."

"It's wonderful to have all the soft water I need," says Mrs. Smith. "We had a cistern here when I was a girl, but we used well-water for many purposes and mother's teakettle always seemed to be full of scale. That's still one sign to me that the softener needs regenerating. My teakettle starts to coat over a little. Once the water starts getting hard again, it comes fast. It seems that one day you have a nice suds for dishes and the next day your dishwater is flat. That's when you can really see and appreciate the difference in having soft water!"

What Do Softeners Cost?

The greatest expense in installing a softener unit in the farm home is the initial outlay. You can probably make the installation today for between $150 and $400, depending upon the size unit and the brand unit you buy. Thirty-five to fifty dollars of this amount is the cost of installation by the dealer or plumber who does the job for you. An iron filter costs an additional $110 to $140, de-sulphurizers start at about $150, sediment filters start at $100, acid neutralizers begin at about $120, and taste and odor filters are priced at $90.

Once your softening unit is installed,

(*Continued on page* 125)

SOFT WATER makes a difference. A home water softener is shown on the left in this laundry. The hot water heater is in the center and the washing machine is on the right. This water softener is being used with a brine tank.

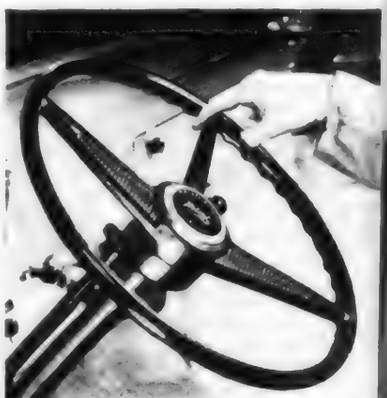
TRIPLE ECONOMY

It's the biggest truck news of '54

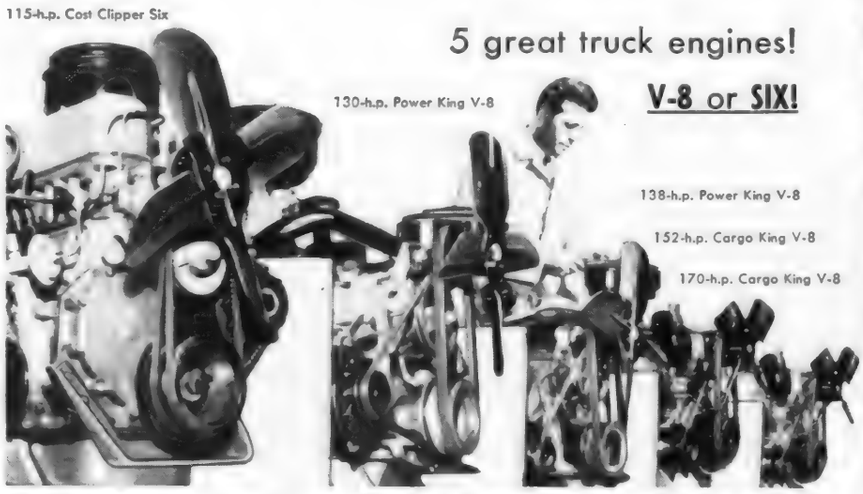
Never before have so many important advancements been made in all the 3 biggest truck savings-areas as appear in the NEW Ford Trucks for '54! The mightiest concentration of power per cubic inch ever built into any truck engine line! Better working facilities for the driver. Bigger capacities too!

New Ford Trucks for '54 offer important *money-saving* advancements you just can't get in any other trucks. Take engines, for example. For the power they develop, Ford Truck engines for '54 have less cubic inch displacement than engines in other-make lines.

For instance, Ford's 239-cu. in. *Power King* V-8 develops its 130 h.p. on as much as 43 cubic inches less displacement. *Every cubic inch of displacement in an engine is a "hungry inch" that demands gas.* Small-displacement engines normally need *less* gas. And that's only *one* big factor behind Ford Truck *Triple Economy* for 1954.



NEW Ford Master-Guide Power Steering standard on Series T-800, optional at extra cost on most other BIG JOBS! Cuts steering effort as much as 75%.



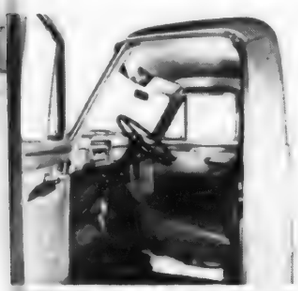
Only Ford gives you Gas-Saving, LOW-FRICTION, High-Compression, Overhead-Valve, Deep-Block engines in ALL truck models! All with advancements like Ford-designed overhead rotating valves for longer valve life, short-reach manifolds for higher breathing efficiency.

Smooth power! NEW Deep-Block design! Ford engine blocks have deep-skirt crankcases, wide-base flywheel housings, for high structural rigidity.

1. NEW LOW-FRICTION engines offer power increases up to 23%! One reason for greater power *with gas-saving economy:* new wedge-shaped combustion chambers create higher turbulence, burn gas more completely, without pre-ignition.

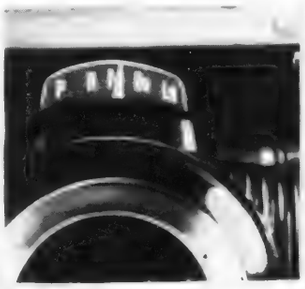
2. NEW 3-MAN DRIVERIZED CABS for easier, safer control! For economy that results from keeping the driver *fresh* on the job! Exclusive Ford seat shock snubbers. New woven plastic upholstery "breathes" like cloth. Huge curved one-piece windshield for visibility unlimited!

3. NEW Capacities! 6-Wheelers, Cab Forwards, over 220 models! Ford's new line goes all the way from Pickups to 60,000-lb. GCW BIG JOBS—new factory-built 6-wheelers—two more giant Cab Forward Series. Minimum deadweight increases payload capacities.



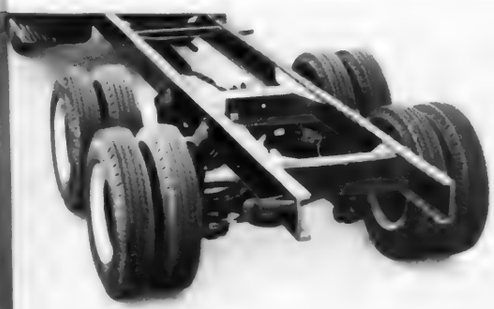
ONLY Ford has DRIVERIZED CAB comfort! Deluxe Cab shown has foam rubber seat padding, plus 15 other custom extras (at extra cost).

NEW Ford engines reduce friction losses up to 33%! Short-stroke design cuts internal friction, delivers more usable power per gallon of gas.



NEW Fordomatic Drive saves driver time and energy. Fully automatic! No clutching! No shifting! Available in all Ford light-duty models for '54.*

NEW Vacuum Boosted Power Brakes now available on half-tonners make stopping up to 25% easier.* Pressure needed to stop truck won't break light bulb.



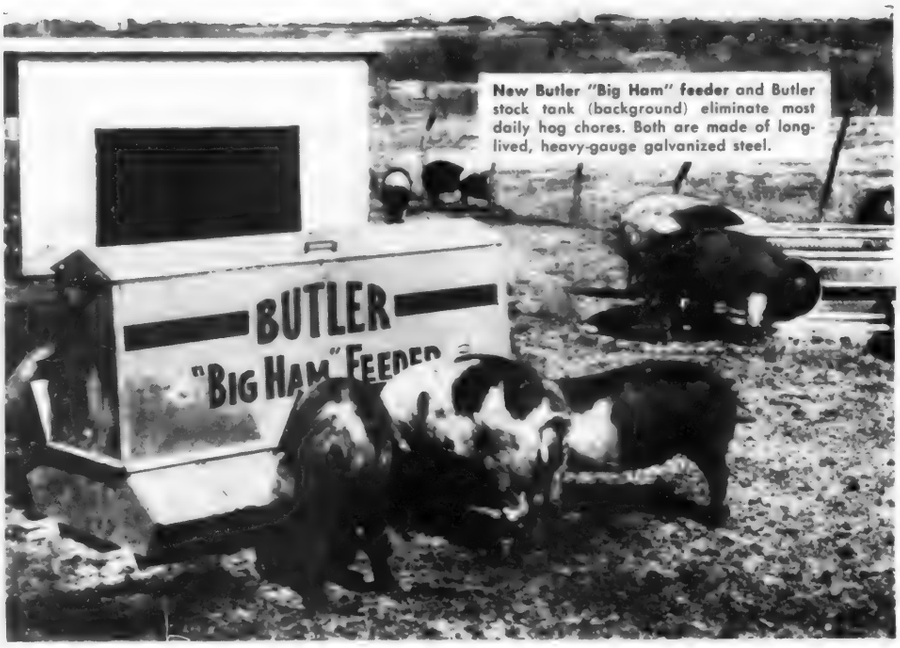
For '54, Gross capacities increased up to 48% with two all-new Tandem-Axle BIG JOBS. Rated up to 60,000 lbs. GCW! Four wheelbases, 144 in. to 192 in. Priced with the lowest. Ford-designed chassis with Ford-installed tandem axles.

*All items marked by an asterisk in this advertisement are available at worth-while extra cost

Farm Favorite—new F-600 ("2-ton"). Choice of three LOW-FRICTION engines.

FORD TRIPLE ECONOMY TRUCKS

MORE TRUCK FOR YOUR MONEY



New Butler "Big Ham" feeder and Butler stock tank (background) eliminate most daily hog chores. Both are made of long-lived, heavy-gauge galvanized steel.

You can save feed...

Cut chore time with new

BUTLER "Big Ham" Feeder

You can fill this new, heavy-duty Butler "Big Ham" with a supply of feed . . . and forget the daily drudgery of carrying feed to your hogs! Its big, weather-tight, galvanized steel hopper makes it easy to keep a fresh, clean ration before your hogs constantly for fast, thrifty gains. And with a choice of 4, 8, 12 and 16-lid sizes, you can feed from 20 to 80 hogs with only *one* "Big Ham" feeder!

See your Butler dealer. He'll show you the new Butler "Big Ham" hog feeder, also full line of Butler stock tanks with hog fountain.

Send coupon for name of your nearest Butler Blue Ribbon dealer, also free folders on the new "Big Ham" feeder and Butler stock tanks.

Compare Butler's construction with other feeders you've seen

1. **Armored for abuse** — 20-gauge galvanized steel body, reinforced for big hogs.
2. **Full-depth partitions**—Prevent mixing of different feeds and supplements.
3. **Dependable agitators**—Activated by hogs to keep feed from bridging in hopper.
4. **Adjustable feed regulators**—Let you set feed flow quickly, even when full of feed.
5. **Sturdy skids**—Equipped with clevises for fast hitching and easy moving of feeder.
6. **Replaceable parts** — Bolted construction makes replacement of parts simple, economical.

For prompt reply, address office nearest you:

BUTLER MANUFACTURING COMPANY
7378 East 13th St., Kansas City 26, Missouri
978A Sixth Ave., S.E., Minneapolis 14, Minnesota
921 Avenue W, Ensley, Birmingham 8, Alabama
Dept. 78A, Richmond, California

Please send me the name of my nearest Butler dealer, also more details on Butler Blue Ribbon hog equipment.

Name.....

P. O.....

R. F. D..... State .....

BUTLER STEEL PRODUCTS

Manufacturers of Oil Equipment
Steel Buildings • Farm Equipment
Cleaners Equipment • Special Products

Factories located in Kansas City, Mo.
Galesburg, Ill. • Richmond, Calif.
Birmingham, Ala. • Minneapolis, Minn.

MEDICINE MAN

(*Continued from page 59*)

any chance, the bottled magic failed to do the work at hand, grandfather was not stumped. He had a lot of superstitious hocus pocus at his command in an emergency. For example, chewing tobacco and kerosene, taken internally and rubbed on, was good for tetanus, or lockjaw; an old sock, smeared with grease and forced down a cow's thoat, cured bloat and indigestion; if a dog had mange, a copper wire hung around its neck soon checked it; and if a horse got stubborn and lazy, grandfather laid a board across his head and gave it a smart whack with a hammer. He also treated for diseases that never existed, like hollow tail and hollow horn.

When the Foods and Drugs Act came in the patent medicine people had to back up their claims for the universal powers of their goods. Most of them went out of business. The colleges began turning out well-trained veterinarians, grandfather's grandson took four years at the state ag college, and now runs the farm. Livestock therapy is more complicated today, but the livestock are better off.

COUNTRY FIRE EATERS

(*Continued from page 41*)

$1,000 and $5,000; 38 cost between $5,000 and $10,000; 17 between $10,000 and $15,000; and one solvent district splurged on a job costing between $15,000 and $20,000. However, a fire truck with no accessories is helpless at a fire so the more costly trucks were probably the better buy in that more equipment was already installed on the truck.

The survey reported the increasing use of high-pressure pumps because they use a minimum of water and cause little water damage. High-pressure pumps with fog-spray nozzles were found to use between 100-300 gallons of water per fire. Thus a tank truck carrying between 300-500 gallons has its whole water supply on the truck.

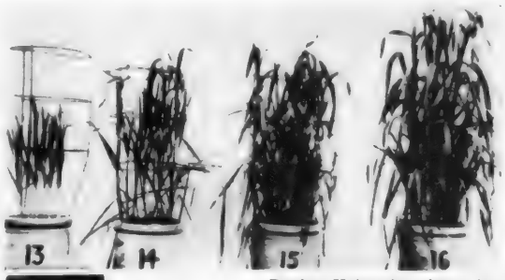
Some departments report fog spray inadequate in dealing with a conflagration and say that they prefer full nozzle streams with reasonable penetration and volume. Pumps which convert from high-pressure fog with a small-diameter hose to a larger hose which throws a stream of water at ordinary pressures are being manufactured. These may meet the double need.

"Wet water," three to five times more penetrating than ordinary water, is used on some trucks for fighting country fires. Firefighters are divided in their opinion of its effectiveness. Basically, it is a wetting agent added to water, which reduces the surface tension of the water and makes it more penetrating. Says Chief Francis Wolfangle of the Anderson Township Fire Dept., in Hamilton County, Ohio, "We used 'wet water' on our grass fires last year with good results. It should work good for

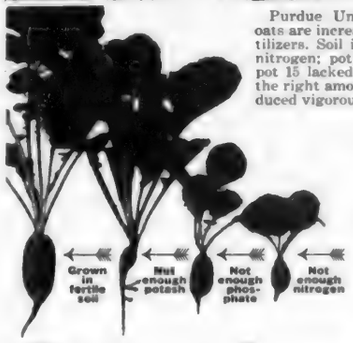
Increase Your Income NOW with More Bushels or Tons per Acre

AS MUCH AS

227 Bu. Corn — 125 Bu. Wheat — 125 Bu. Oats
30 Tons Tomatoes — 5 Tons Hay — 906 Bu. Potatoes
Increase Milk Production as Much as 300%



Purdue University shows how oats are increased with correct fertilizers. Soil in pot 13 was low in nitrogen; pot 14 low in phosphate; pot 15 lacked potash. Pot 16 with the right amounts of all three produced vigorous, healthy growth.



The radish at left compared with the three at right is concrete evidence of the cold-cash benefits of soil testing for every kind of crop. You will have greater size, earlier harvest and high quality in root crops, also lush foliage and vigorous growth of leaf, fruit, vine and grain crops.

Lack of the right fertilizer cuts your profit on all crops, just like corn yields at left. Ear 1 was grown in balanced soil. The stunted, deformed ears were grown in poor soil — (2) lacked nitrogen; (3) needed phosphate and (4) was potash starved.

You, too, can harvest bumper yields from every crop you plant. With these easy tests you'll get back up to $15 in extra yield, for every dollar spent on fertilizer. Your **Sudbury Soil Test Kit** will pay for itself many times over even the first season. It will guide you not only in planting, but all summer long. You'll keep on getting steady increases for years to come — actually building up your soil instead of draining its vitality.

The U. S. Dept. of Agriculture predicts a constantly increasing demand for years to come and urges more production per acre to supply our country's needs — stressing use of the right fertilizer (indicated by soil testing) as the surest way to increase yields.

Save Hundreds of Dollars!

Soil Tests make every acre pay up to double or triple former yields. Soil experts agree that most farms could produce twice as much — simply by correct fertilization. Sudbury users all over the country report tremendous increases in both yield and quality; like H.C.B. of Ohio who doubled his wheat crop, tripled corn and hay, boosted oats 500%. The Sudbury Soil Test Kit guarantees bigger and better crops.

You not only make more money, you save money — every season your Sudbury Soil Test Kit can save you up to $15 an acre on fertilizer. Guessing wastes both time and money. No one can know what last year's crops took out of the soil without testing. Using the wrong kinds can do more harm than none at all. A farmer in Illinois "guessed" he needed 235 tons of limestone, but tests showed he didn't and saved him $500 which paid for the phosphate really needed on 65 acres. That wrong guess could have cost him more than a dozen Soil Test Kits.

Farmers deLuxe Soil Test Kit

Complete with everything you need for hundreds of tests. More valuable to you than all your stock and tools! Shows the right amounts of nitrogen, phosphate and potash for each field. Also shows whether lime is needed (pH) and how much. Lifetime welded steel chest with carrying handle, weighs only 12½ lbs. Easy instructions and charts show needs of 225 different crops. Order today, big value, low cost — **only $29.95!**

No Knowledge of Chemistry Needed

So simple anyone can use it. Even your first tests will be accurate and reliable. There's no waiting for reports — the correct answer is printed right on the chart. Ready to use anywhere, anytime, even right out in the field. Make "on the spot" tests whenever you wish.

EASY AS READING A THERMOMETER

Takes only 10 minutes, costs less than 10¢ a test. You'll learn more about your soil than from a lifetime of farming. An indispensable aid to more profits. Ag. colleges, county agents, experiment stations and progressive farmers everywhere depend on it — so will you! Farmers without Soil Test Kits lose many times their cost each season.

400,000 Users Can't Be Wrong

G. H. of Ohio writes "I have made many tests; like its simplicity and accuracy. Worth 1000 times its cost on my 320 acres; found them low in phosphate."

A. F. B. of Iowa increased his bean yield 50% after correcting phosphate deficiencies which his Sudbury Soil Test Kit revealed.

W. L. D. of Pennsylvania saved $400 on fertilizer. "The Kit has paid for itself over and over again," he says.

S. G. H. of Michigan "guessed" his potato field had enough potash but needed nitrogen. Fortunately he tested his soil first and found he was wrong on both counts. He saved the nitrogen, added potash and doubled his yield!

R. S. G. of Indiana tested his soil and discovered potash was badly needed — has increased corn yield 20%!

You Take No Risk

Our Daring Guarantee — We are so certain you'll get bigger yield and better quality with your Kit, we'll refund the full purchase price anytime this year, if you don't.

BETTER CROPS Guarantee

SEND NO MONEY

Order today, C.O.D. **only $29.95** plus postage or send check and we'll pay postage, saving you from $1.26 to $2.93 in postal charges.

FREE BOOK — "Our Land and Its Care"

In addition to saving postal charges, when you send check with your order we also include this valuable 64-page book on farm management FREE.

Also sold on Easy Payments if desired — see bottom of coupon.

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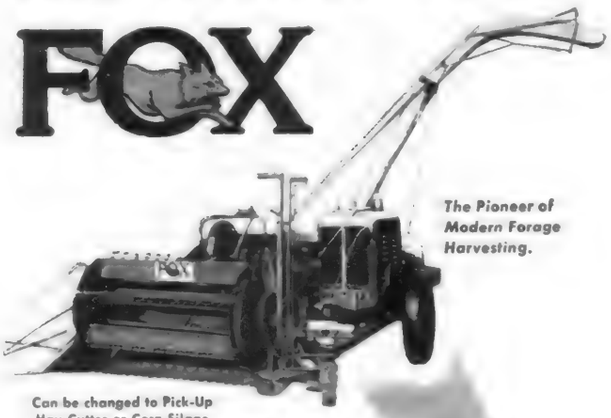
World's Largest Makers of Soil Testing Equipment

Summer Pasture All Winter with FOX



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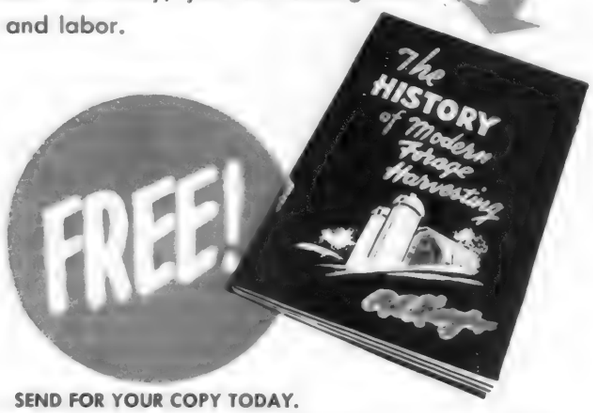

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APPLETON FOX WISCONSIN

hay, too. It makes your tank of water on the truck go twice as far. We use a product called 'Fire Water,' one gallon to 600 gallons of water. Don't let the name throw you, though; it's nothing like the Indian variety! You can also use some of the modern detergents like 'Vel' to make water wetter. A package will mix with 100 gallons of water."

The Rural Fire Fighter

An adult male citizen becomes a volunteer fireman by applying for membership in the local fire department or by pitching in with other volunteers at a fire and being invited later to join the unit. Once a member, he finds himself in a brotherhood more tightly knit than a family, and more jealous of its status and responsibility than a college fraternity. Once a man is a volunteer fireman, he must either leave the community or drop dead to get out of the organization, although some volunteer organizations provide by constitution for the rare fireman who misses serving at three consecutive fires. Unless a man is ill, this seldom happens, for once a citizen has served his community at a fire, has lived through the taut-nerved triumph of reducing raging destruction to smouldering ashes, there is no turning away from the brotherhood of those with whom he has risked his life. It gets in his blood, and his wife becomes a "firehouse widow."

Volunteer firemen die at their jobs every year. In one western community alone, six firemen have given their lives in the past two years: one engineer was killed by a careless driver while he was operating a pump in a wheat-field fire; three volunteers died when an unpredictable wind-shift caught them in a large field of fire; and two others drowned during a rescue operation when a back-log of water from a railroad trestle gave way and swamped a fire department boat during a flood. In spite of this, nearly all the volunteer fire departments have waiting lists of applicants for membership or can always find an eager prospective member when a vacancy occurs in the ranks.

A Fireman's Education

Just being willing to get out of bed on a cold or rainy night to go fight a fire is not all that is asked of a volunteer fireman. There is more to fire fighting than the dousing of everything in sight with lots of water. During drought seasons water isn't always available. A trained fireman uses the minimum of water. And there is a *right* way to fight fire.

The training of volunteer firemen in up-to-date fire fighting methods is handled differently over the country, but the overall results in property-savings make even more active efforts along this line feasible.

In some states, departments connected with land-grant or state universities prepare and conduct special courses for fire-fighters, be they volunteers on call, or paid civil service employees on duty. Expenses for the course are defrayed by the city, the village, or the township. A fireman paying his own way is the exception rather than the rule.

Far-sighted volunteer units usually send the newer men to the course until everyone has attended at least one time. Unfortunately, there are still volunteer companies in which *no* volunteer has been to a fire-fighting course. Moreover, the same volunteers never meet to discuss or rehearse fire-fighting practices. These departments are a rapidly diminishing minority among civic-minded volunteers who man good, up-to-date equipment with the newest practices. Most firemen prefer fighting a fire mentally as well as physically. Mentally, man is fire's master.

From annual courses held in universities, through district educational meetings to custom-styled courses for the individual unit on its home ground, fire protection education is showing rapid and solid growth, and is returning big dividends on saved buildings and other properties.

Typical of the district educational meeting is the annual Field Meet of the Northern Colorado Fire Fighters Association, which, after a noon picnic, features contests between the fire-fighting units in the region. The contests give rural fire fighters an opportunity to show their skill in drafting water from a ditch, in fighting field fires, and in solving typically rural fire problems with men who are working in the same area of fire protection.

157 BUSHELS OF CORN PER ACRE with HYBRO-TITE*

Nature's own 20-mineral SOIL CONDITIONER

17 BUSHELS ABOVE AVERAGE—"Today, I received my official 5-acre corn yield report for 1953. My yield is 157 bushels per acre," writes Mr. T. W. Hilligoss of the Shamrock Seed Farms, McCordsville, Indiana—shown at right with some of his prize-winning corn.

Mr. Hilligoss applied Hybro-Tite last spring, and he gives it much credit for his high yield: "The Hybro-Tite surely played an important part."

High yields are a specialty of Mr. Hilligoss. "My average yield for 14 consecutive years, 1940 to 1953, is Indiana's highest—139.7 bushels per acre," he said. His yield with Hybro-Tite was 17.3 bushels above average.

MORE AND MORE USE HYBRO-TITE—Last year many farmers used Hybro-Tite on many crops—grain, row-crops, legumes, pastures, fruit and vegetables. Their outstanding results are convincing evidence of the value of this 20-mineral** soil conditioner.

Read the enthusiastic letters on this page. They tell you how Hybro-Tite has helped grow bigger and better yields—improve pastures—bring worn out or problem soils into more profitable production!

LOW-COST SOIL CONDITIONER—Hybro-Tite is an economical natural rock soil conditioner, containing potash plus 19 trace minerals. *It is one soil conditioner you can afford to apply to all your acres now!* Minerals in Hybro-Tite are released gradually over several years.

EASY TO USE—You apply Hybro-Tite just like lime. A ton per acre is the usual rate. On some soils, you may wish to apply natural phosphate (raw rock or colloidal) at the same time.

TRY HYBRO-TITE NOW!—If your soil lacks potash or the 19 trace minerals, Hybro-Tite may help you improve your soil at low cost ... help you boost your yields as it has done for so many others. You owe it to yourself to get the facts. Write for free booklet, prices, more success reports, *today!*

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**Potash—plus aluminum, silicon, sodium, titanium, calcium, phosphorus, magnesium, iron, manganese, strontium, yttrium, silver, zinc, zirconium, lead, chromium, nickel, copper, vanadium.

***New* FREE BOOKLET!**

GET YOUR COPY! Just off press! Send for free booklet, "Nature's Own 20-Mineral Soil Conditioner." Gives you details of low-cost, easy-to-use Hybro-Tite. Write Charles L. Davidson, President, today!

Mr. I. B. Hudson (left) points out to Charles L. Davidson, President of the Potash Rock Company of America, the 2 ears per stalk of corn grown on Hybro-Tite treated soil.

YIELD JUMPS FROM 75 TO 100 BUSHELS!

"The land we used Hybro-Tite on this year yielded less than 75 bushels of corn last season; besides, we had considerable difficulty with stock rot and were unable to pick the corn with mechanical pickers.

"This season we had slightly over 100 bushels corn per acre on the same soil, and it was practically free from either stock or root rot. We were able to pick the corn with mechanical pickers with very little difficulty.

"We are firmly convinced that our soils are greatly depleted in trace minerals, especially Potash, and we are confident there is no more economical way to replace this deficiency than by the liberal use of Hybro-Tite."—I. B. Hudson, Sr., I. B. Hudson & Son, Selbyville, Del.

HYBRO-TITE PAYS ON MANY CROPS SAY MANY USERS

BIG HAY YIELD—"On a 9-acre field of Coastal Bermuda grass, we gathered 40 tons of hay. Incidentally, this 9-acre field has sustained 13 head of cattle during this spring and summer."—Isham J. Dorsey, Dorsey's Stock Farm, Opelika, Ala.

WONDERFUL GRASS—"The St. Catherine Academy Farm put 15 tons of Hybro-Tite on 15 acres of Kentucky fescue ... worked up from worthless bluegrass ... The stand was and still is wonderful. Right now they are pasturing 20 Jersey milk cows on this field."—Mrs. John B. Bauer, La-Z Valley Apiaries, St. Mary, Ky.

FINE ORANGES—"I have just received a letter from the Spada Fruit Sales Agency, stating they had finished picking all the Hamlin oranges in the North Block of our grove—slightly over 1,400 boxes. They stated the solids were unusually high in this fruit, and that tests were well above the maturity standards required by law. I thought you might like to know the fruit mentioned is from a block of comparatively young trees, which were treated with Hybro-Tite, January 3, 1953. The trees look better than they ever have since we owned them."—George E. Chambliss, Winter Haven, Fla.

PASTURES HELD UP—"Our pasture test showed two very important things: 1. The grass held up a lot better during the dry weather this year than it has before. 2. The cattle seemed to prefer grazing where the Hybro-Tite had been put."—A. J. Andreoli, Pantego, N. C.

NURSERY STOCK GROWS FASTER—"I am very pleased with the results I have obtained from the use of Hybro-Tite. I have used it on 2,500 evergreens, which are doing better now than ever before. For example: My Colorado Blue Spruce has grown from 4 to 6 inches this year, which is about 2 to 3 inches above the yearly average. These trees are only 4 years old. My Japanese Yews, Arborvitae, and all other trees (about 5,000), have done better this year than any in our community. Our vegetable garden has absolutely amazed us. It is giving twice as much produce this year than it ever has before."—Joseph Zilka, Cleveland, Ohio.

POTASH ROCK COMPANY OF AMERICA, INC.

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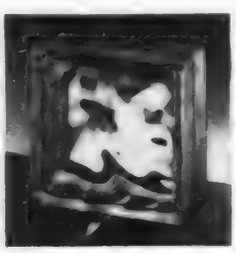
PC Glass Blocks reduce maintenance costs, too. It's easy to keep them sanitarily clean, and they eliminate expensive window repairs. And they add so much to the appearance of your farm buildings. Mail coupon for free booklet today.



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The custom-styled course works especially well for the newly organized department. In California, for example, traveling instructors go from department to department over the state to devise courses to fit the immediate needs of the department and to advise on equipment and practices already in effect.

Although methods of fire fighting vary with the type of fire and with the terrain in which it occurs, some state-organized fire fighting courses do not distinguish between fighting a city fire and fighting a fire in rural areas; but do teach firemen to handle brush and forest fires. In most of the university courses, however, rural fire fighting takes its place as a highly important facet, particularly in predominantly agricultural states.

An outline, "Fighting Rural Fires," prepared by a sub-committee of the National Fire Protection Association, is available for use in training courses. A booklet, "Standards of Volunteer Fire Departments for Rural and Small Communities," No. 192, may be purchased from the N.F.P.A., 60 Batterymarch Street, Boston, Mass., for 50 cents.

The Fireman and the Farmer

What the community firemen know about the individual farmer and his farm may be the means of saving much valuable property. In a new fire prevention program, members of many local fire departments are conducting fire safety surveys. Through these surveys, firemen discover existing fire hazards on farms in the townships, seek out the best routes to individual farms, and learn where the water supply, the gasoline tanks, the fire extinguishers, the master switch, and the machinery are located on each farm. With such detailed information and a sketch-map of the farm layout, the firemen are preparing themselves to fight that farm's fire before it comes.

Progressive departments are preparing card and map systems. The map is a large, read-at-a-glance affair which shows the fire protection district with the farms located by road and by number, not by the owner's name. The Smith farm, for example, is not the Smith farm but No. 18. Should Smith sell to Jones and Jones phone the firehouse and say, "This is the Jones farm," when he sends out his S.O.S., the firemen on duty won't know from up, and will waste valuable time getting directions. A recent tragic and expensive fire might have been quelled in time had the firemen not had to consult the telephone book for the location of the farm. In a mix-up in road names, the telephone company had listed the farm on the wrong road. The firemen never did get where they were going.

The firehouse map and card file are equally valuable to the fire fighter because the card can be snatched from the file and consulted on the way to the fire. On the card is listed the information the firemen have from the survey: the farmer's name, the number of his farm, its location, the number of members in his family, where the entrance to the attic is located, the storage place of inflammable and combustible substances, the sketched layout of the farm buildings, the location of the fire cistern or farm pond, and the names of other fire departments which have mutual aid agreements with the local unit for that section of the fire protection district. (Mutual aid between fire departments is an agreement whereby units in two or more communities agree to give aid if they are needed.)

Whether there has been a rural fire safety survey in the community or not, fire-minded volunteers know their fire protection district and its farthest limits; the roads, the crossroads, their condition: the farmers, their farms, the fire cisterns and accessible water supplies and how to get to them. It is more than a matter of pride, sometimes it is a matter of survival, that when the tank truck swings into the farm yard the driver knows which will be the hot side of the fire, where the water supply is, and about how much hose will be necessary to reach it. Because his thinking is fire-trained thinking, he has made his plans before he turned into the farmyard. And there is little fumbling. There isn't time for fumbling.

With a tank truck, a fireman can start pumping water as soon as the hose is laid without wasting vital time in searching for water supplies and getting the flow started. More advanced yet is the jump line. According to Thomas Ward, Special Supervisor

You Pick the tool...

and last...and last!

Almost every implement on the farm loses life and usefulness due to wear...a needless loss for the most part because you can easily protect *all* tools against abrasion. A thin deposit of Tube Stoodite welded over wearing surfaces performs 4 important life-prolonging functions that save you money:

Tube Stoodite provides a super-hard, wear resistant surface which maintains size and efficiency of tools even in the most abrasive soils.

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It saves frequent forging and sharpening costs on tillage equipment.

It makes tilling and cutting tools self-sharpening, thus maintaining high efficiency throughout their life.

Success in hard-facing farm tools is easier than ever before, when you use Tube Stoodite. Just follow the procedures outlined in STOODY'S FARM HARD-FACING MANUAL.

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I use Crawler Type Tractor: YES ☐ NO ☐

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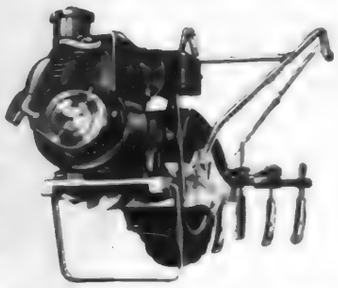
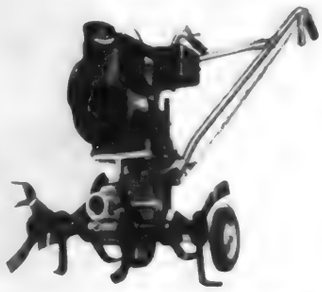


One-Wheel Garden Tractor

Single power unit plus low-cost attachments makes power mower, cultivator, snowplow, sickle bar, other work-savers. Makes gardening even more fun!

1½ to 3 H.P. Low as $153.00. Freight Extra.



Garden Tiller

Easy to use, self-contained unit does all ground work in one clean sweep without attachments.

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With LOW-COST LEAF-MULCHER ATTACHMENT. Makes mowing and weed cutting fast, safe, easy! "Fine cuts" 18-inch swath. Quick change mulcher grinds leaves to fertilizer particles.

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Power-driven. Just seconds per hole for fencing or transplanting. Works anywhere a man can walk.

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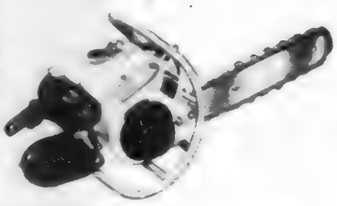

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WELL, the barn is gone—maybe we can save the house.

of the State Department of Vocational Education, at Sacramento, California, almost all California rural fire apparatus have a 1½-inch hose line from 100 to 200 feet in length. This is permanently attached to a special discharge outlet on the tank trucks and enables firemen to attack the fire immediately upon springing from the truck without waiting for hose to be laid.

Each farm has its own fire-fighting problem. If no rural fire safety survey has been made of the fire protection district, the responsibility lies with the individual farmer for leaving a sketch map of his layout and the information the firemen will need at the firehouse. It is to his advantage to have fire extinguishers in his buildings where they may be quickly reached from lanes of constant traffic. Good housekeeping indicates that the disposal of inflammable materials and the disposition of other fire hazards is only good sense.

The best rule, of course, is to fight fire before it comes. But if it does come, the farmer has to start fighting it before the firemen can possibly get there.

Here are the things the National Board of Fire Underwriters lists to do before the firemen come:

"1. Remove all persons from the building . . . don't try to save valuables or pets. If you're trapped on upper floors, close the door of the room first, then make a rope from sheets or blankets, tie one end securely, and slide to safety. Only as a last resort should you throw a mattress to the ground and jump. Use stairways only after taking great precautions. If the door of the room is too hot to touch, do not open it because superheated toxic gases may asphyxiate you. When venturing into hallways, cover the face with wet cloth and crawl along floor.

"2. Telephone the alarm or send someone to summon aid. The fire department number should be memorized by each member of the family and also posted near the telephone.

"3. After learning the location and extent of the fire, begin fighting it with any available equipment.

"4. Protect other buildings and remove livestock from barns."

And to Fight Fire

"1. Use great caution in fighting in a smoke-filled cellar or basement or you may be overcome with poisonous fumes.

"2. Upon discovering a fire, close the door as you leave the room to halt the spread of the fire and cut off drafts.

"3. Open doors and windows in fire areas with extreme care and stand aside. There is a possibility that the additional air may supply enough oxygen to cause an explosion.

"4. Apply water and chemicals at the base of a fire. Don't throw them haphazardly on the flames or into the room."

The National Board of Fire Underwriters warns that "When fire strikes a farm, the first five minutes are more important than the next five hours."

So call the fire department and other help immediately. Chances are you cannot fight the battle alone.

THE AUTHORS: Leland and Rita Puttcamp are a husband-wife team of journalists who make their headquarters just outside Chillicothe, Ohio. Lee teaches photography at the Chillicothe V. A. Hospital, does photographic work for farm equipment advertisers. Rita has published two children's books, contributes regularly to a number of magazines and religious papers. Five year old Chaz completes the Puttcamp family.

COURT OF THE WATERS

Continued from page 50

these in a semi-circle in front of the portal.

As the bell in the cathedral tower strikes the half hour, the verger appears again, carrying a long staff topped with a silver ornament which looks like a boat hook. Behind him come the judges, each dressed in full black smocks, black trousers, and white shirts. Their faces are seamed and tanned to the color of their own fields. They sit down, slowly and with dignity, fold their broad hands in their laps, and look about them, alert and attentive.

Two men push through the ring of spectators and are admitted behind the railing by the verger. They are from the district, Favara, and they stand before the judge from that district. The judge nods to the accuser, who states his case. He is a little man in a worn gray smock, and he talks quietly, twisting his beret in his hands. His neighbor, he says, failed to shut off his water gate at the end of his allotted hour, and he was deprived of thirty minutes of irrigation; his crop is set back; bread has been taken from the mouths of his children; his neighbors will tell the judge that what he says is true.

The accused now answers the charges. He is not calm like the accuser, but waves his arms; he shouts and beats his breast. He admits that he did not shut off the water on the hour, but it was only for a little minute longer; he was delayed by a crisis in his henyard. He calls on God to witness that his neighbor is stretching the truth, he is trying to ruin him. The shrewd peasant eyes of the judge fasten on him. A witness is called. One and then another of the judges asks a ques-

(*Continued on page 92*)

BURCH FOUR-ROW FLEXI-HOE

WORLD'S ONLY POWER LIFT 4-ROW SURFACE CULTIVATOR!

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SPECIALIZED POWER-LIFT AND DRAWBAR IMPLEMENTS
- Wheel-Type Disc Harrows
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Model 161 with DIRECT CUT ATTACHMENT

POUND for POUND PAPEC COSTS LESS THAN ANY OTHER MAKE!

FOR ALL 'ROUND PERFORMANCE YOU CAN'T BEAT PAPEC!

FARM BOOKS

(*Continued from page* 18)

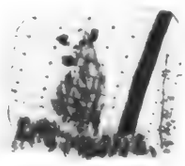
For those interested in building costs (and who isn't) there are tables which provide the means for figuring the cost of a new building in any part of the country. There are also depreciation schedules for farm buildings and helpful suggestions in estimating the value of old buildings.

Planning Farm Buildings is a companion volume to Professor Wooley's earlier book *Repairing and Constructing Farm Buildings* which proved to be a very useful reference book for the farmer. We believe this latest book to be even more valuable.

Thomas Jefferson's Farm Book, *edited by E. M. Betts, Princeton University Press, Princeton, N. J. $15.00.*

Jefferson's notes, accounts and comments concerning the operation of his estates are here reproduced in facsimile which show every fingerprint, smudge, correction, and even an occasional Jeffer-

(*Continued on page* 152)



The Farm Book Store

The Editors of the Farm Quarterly, after a careful selection of current agricultural books, recommend the following to our readers.

SOIL AND CROPS

Corn and Corn Growing—*by Wallace and Bressman* ... $5.00
The first hybrid producer tells all about raising corn.

Colorstrip Plant Testkit ... $4.00
A compact, accurate tissue testing kit that can be carried in the pocket. Tells whether your crops are getting enough nitrogen, potassium and phosphorus to make good growth and produce high yields. Complete instructions come with the kit.

Pasture Production and Management—*by R. H. Lush* ... $3.75
Management of the grasses and legumes and the animals that eat them.

Irrigated Soils—*by Thorne and Peterson* ... $5.50
The practice of irrigation and the management of irrigated soils.

Forage and Pasture Crops—*by W. A. Wheeler* ... $8.00
A guide to the growing of all forage and pasture crops.

Soils and Fertilizers—*by Firman E. Bear* ... $6.00
An understandable book on the complex subject of fertility.

Grasses and Grassland Farming—*by Hi W. Staten* ... $5.00
One of the best books on practical grass farming.

Weeds—*by W. C. Muenscher* ... $7.50
The identification and control of these soil bandits.

The Pasture Book—*by W. R. Thompson* ... $3.50
Revised edition, the 8th since 1949, of this information-packed book.

Complete Herb Grower's Kit—*by Rosella Mathieu* ... $3.50
Growing, blending and marketing herbs: includes seeds and samples.

Our Garden Soils—*by Charles E. Kellogg* ... $4.00
A beginning course in soils for the gardener.

Pastures—*by Lancaster, James, Bailey, Harris* ... $3.75
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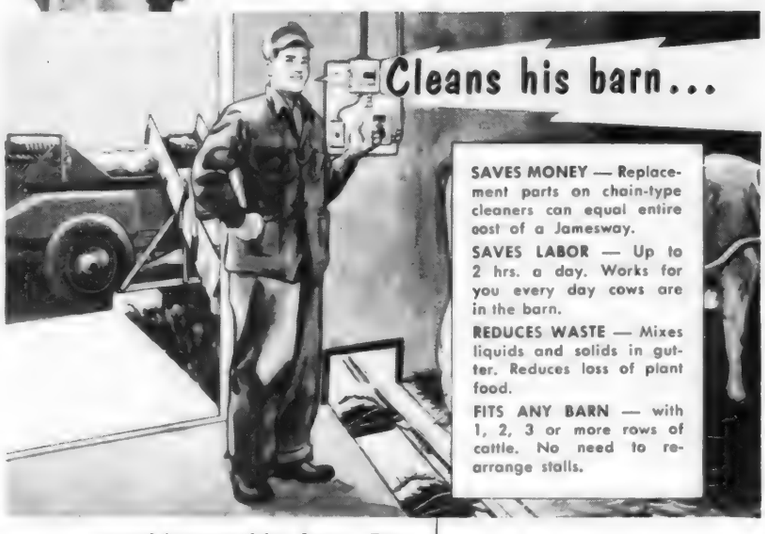
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SAVES MONEY — Replacement parts on chain-type cleaners can equal entire cost of a Jamesway.
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This Jamesway Power Choring Silo Unloader unloads grass or corn silage, frozen or unfrozen. Breaks up chunks. Improves palatability. Saves feed and time. Prevents silo accidents and cave-ins.

Ventilates his building

Jamesway Power Ventilation takes moist, clinging, smelly air out of your barn. Reduces profit-robbing drafts, sudden temperature changes. Works better because it's built for the farm.

Power Choring Cattle Feeder

Works with Silo Unloader to make entire operation an easy push-button job. Write for complete details.

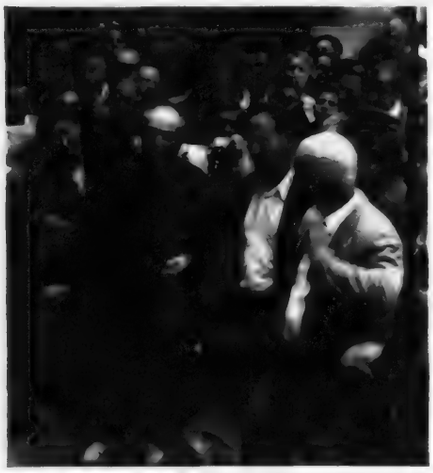
FIRST IN POWER CHORING

COURT OF THE WATERS

(*Continued from page* 89)

tion. The sympathy of the crowd is divided. One hears murmurs, "It is true," "Ramon has a good case," "Ramon is bitter and he exaggerates."

Finally the two litigants are dismissed. The President looks from one to another



"MY NEIGHBOR seeks to ruin me."

of the judges. There is a low-voiced discussion. Finally they are all in agreement. The President asks the accused to stand before him. "You have used water that does not belong to you; you have wronged your neighbor and caused him damage. You will pay him twenty pesetas at once. This is your first offense, and your penalty is light. But do not let it happen again."

The accused bows his head and walks away. He seeks out his neighbor and counts out the twenty peseta fine. He pays promptly, for he knows that there will be no water in his ditches until he has satisfied the court. The case is closed.

The second case is an anticlimax. There is no drama here, for a farmer asks for permission to build an extra water gate into one of his fields. The judge for that district is consulted, and says it is a fair request, and should be granted.

The verger looks about; there are no other cases. He declares the Tribunal of the Waters closed. The judges file back through the door, the verger takes in the railing and the chairs, and the crowd slowly melts away down the narrow streets. Two or three old men remain; they seek out a bench and sit down.

The pigeons return from their perches on the gargoyles of the cathedral towers: a little dog trots across the plaza; a nursemaid leads her two small charges to a shaded bench.

The Plaza de la Constitucion goes to sleep for another week.

ARCADIAN® 12-12-12
is rich in nitrogen

Nitrogen Pays $63 for $15

Side-by-side tests prove the value of nitrogen in producing bigger yields of better quality corn. The corn at right received the equivalent of 833 pounds of O-12-12 per acre plowed down before planting and produced 57 bushels of shelled corn per acre. The corn at left received the equivalent of 833 pounds of 12-12-12 per acre plowed down before planting and produced 99 bushels of shelled corn per acre. Both plots also received the same starter fertilizer.

The addition of 12% nitrogen to the fertilizer increased the corn yield 42 bushels per acre...and improved the quality of the entire crop. An investment of $15 per acre in nitrogen returned $63 in extra corn.

CORN needs abundant nitrogen to produce big yields. ARCADIAN 12-12-12 Granulated Fertilizer contains four times as much nitrogen as 3-12-12. About half the nitrogen is quick-acting nitrate and the remainder is long-lasting ammonia for graduated feeding of crops.

It will pay you to produce bigger yields of corn at lower cost per bushel. Give each acre 500 to 1,000 pounds of ARCADIAN 12-12-12, plowed under, disked in or banded deeply. ARCADIAN 12-12-12 keeps corn green and growing throughout the season and produces an abundance of well-filled, plump ears. The crop matures earlier and yields many more bushels of better quality corn with a much higher protein content.

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Packed in easy-to-lift, 80-pound bags, ARCADIAN 12-12-12 is non-caking, non-dusting and free-flowing in all types of fertilizer distributors. Made by a newly-developed process, the small, firm granules stay in excellent condition for long periods in storage. ARCADIAN 12-12-12 is an excellent fertilizer for corn and other crops. Ask your County Agent or Experiment Station Agronomist!

Contact your Arcadian 12-12-12 distributor or write us for the name of your nearest distributor. Buy your Arcadian 12-12-12 now and store it on your farm until you need it. The supply is limited!

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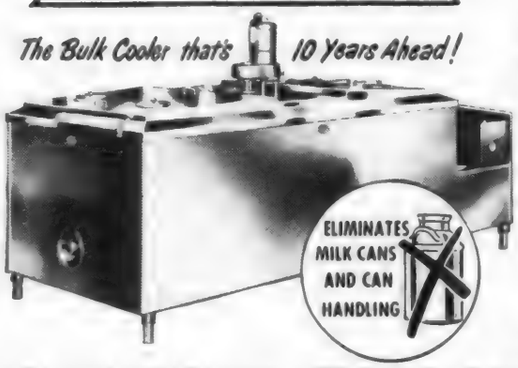
BULK MILK COOLER

The Bulk Cooler that's 10 Years Ahead!



Milk is rapidly cooled to well below 40°, assuring a low bacteria count and better milk. Because the coolant is ice-water — the milk cannot freeze.

Dari-Kool tanks are easy to clean and may be sanitized with hot water without damage.

Units are ready to plug in. Nothing else to buy or install.

In a wide variety of sizes from 100- to 700-gallon capacities.

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DAIRY EQUIPMENT COMPANY

1444 EAST WASHINGTON AVENUE • MADISON, WISCONSIN

THE NIGHT RIDERS

(*Continued from page* 58)

and fifty armed and masked men marched into the town, applied torch and dynamite to the two factories and marched out of town singing, "The fire shines bright in my old Kentucky Home!"

After the Princeton raid, rumors spread that attacks were planned on other warehouses and towns throughout the Black Patch. But the Riders lay low for a full year. Then early on the morning of December 7, 1907, they pulled off their most daring and biggest attack.

A month after the Princeton affair, they had made a test raid on Hopkinsville. This maneuver had shown them that any attempt to set the home fires burning in Hopkinsville was going to take careful planning. There was a company of militia there and the citizens were not particularly sympathetic to the Night Riders' ideals. They were prepared to take up arms in defense of their city and its industries.

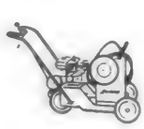
Eleven months passed and the townspeople were off guard. The 150 or more Riders who filtered unobtrustively into town on December 6, the day before the raid, found that an attack was far removed from the Hopkinsville mind.

Early that evening the main body of raiders started riding toward the city from the west. Around midnight they dismounted and left their horses in charge of guards on the outskirts of the town.

INTERCHANGEABLE ATTACHMENTS FOR YEAR 'ROUND WORK-SAVING USE!

ROTARY MOWER

Cut toughest weeds; mow finest lawns. 20-inch size has cast aluminum hood, glide pan support to prevent turf scalping.



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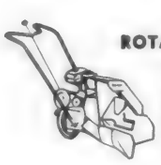

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Throw (not blow) snow up to 15 feet away! Clear 16" path through snow or slush. Self-propelled.

PLUS . . . recoil starter, depth regulator wheel, litter stirrer disc, electric generator, paint sprayer.

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MAKES GARDENING EASY! DOES HOURS OF BACK-STRAINING WORK IN MINUTES!

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See your dealer for full details and colorful literature or write:

Ariens

117 CALUMET ST. BRILLION, WIS.

A short time later this battalion of some 250 marched into the city and were joined by their confederates, planted like Trojan horsemen, within the walls.

The attack had been perfectly planned and was perfectly executed. They took over the police station and all the police officers on duty, captured the two telephone offices, the armory and the fire department, and then set about their principal work, the destruction of two warehouses, one operated by an independent tobacco dealer sympathetic to the Trust and the other by Regie agents. Besides these buildings, an Association warehouse and a flour mill were damaged, a livery stable was burned, and a number of residences and business houses were damaged.

The citizens were warned by gunfire and shouts to keep to their homes. Those who strayed into the streets were rounded up and corralled at a central location. Within an hour, the Riders' work had been accomplished and they made an orderly withdrawal. Three burghers had suffered slight injuries and Dr. Amoss, the leader of the raid, had been struck in the head by gunshot. His injuries were not serious.

Major Bassett, in charge of the Militia at Hopkinsville, organized a posse to pursue the Riders and try to capture the leader. As they caught up with one group, there was an exchange of shots and it was thought that at least one of the Riders was killed. The Riders always endeavored to keep their fatalities a secret.

A month later they pulled a midnight raid on Russellville, burning two warehouses and inflicting miscellaneous damage. Their reputation for action and lawlessness was by now widely established.

The Night Riders either attracted or coerced into membership not only farmers but also most of the leading business and professional men, sheriffs, magistrates, court officials, and even clergymen. Their boast that they feared neither judge nor jury was not an idle one.

To help quash the lawlessness, the Kentucky legislature had made it a crime to scrape a plant bed. But the only individuals ever convicted under the law were a couple of Hill Billy tenants of an anti-Association grower who were accused or using retaliatory measures against Association members.

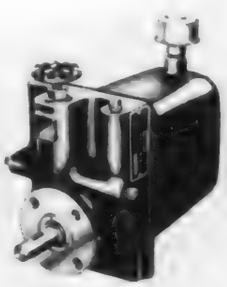
Victims of the Riders who had the courage to bring charges against their persecutors invariably found the Grand Jury packed with an assortment of the accused. County officials were frequently recognized as having been among those who applied the whip or the torch. Sanford Hall, of Lyon County, brought charges against a band of Night Riders only to find himself indicted for bootlegging. When rare cases found their way into court, witnesses for the prosecution became the victims of amnesia. Typical

NEW HOLLAND model 66 Baler
uses VICKERS POWER PACK
to control bale weight

Among features available on the New Holland Model 66 Twine-Tie Baler is "Hydraformatic" . . . the first hydraulic bale tension control system. This system (powered by a Vickers Hydraulic Power Pack) automatically produces bales of uniform selected weight. A simple turn of the handwheel on the Power Pack (see below) adjusts tension to give the bale weight wanted regardless of type of material being baled.

This is another example of the many ways in which Vickers Hydraulic equipment is working on the farm . . . helping make a wide variety of jobs easier, quicker, more economical. The next time you buy farm machinery, it will pay you to make sure the hydraulic units are Vickers.

VICKERS Hydraulic POWER PACK



This convenient and compact "package" consists of pump, overload relief valve, oil tank and filter. The Vickers Vane Type Pump is hydraulically balanced and has automatic wear compensation . . . delivering more oil while taking less power . . . having much longer life with minimum maintenance. Entire hydraulic system is protected against overload.

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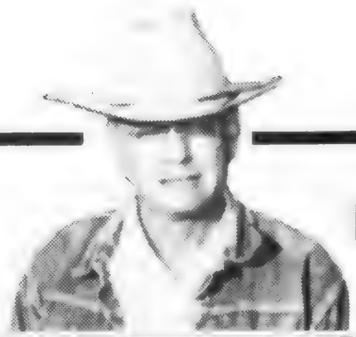

He saved $10,000 by spending $20.

Mr. Manning Vick, stockman, of Graham, Texas, writes us:

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Removes stubble, 3" dia. trees. Guarded 10" blade protects operator. Brushette head $59.75.

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was a witness who took the stand and after a quick look at jury and spectators, testified, "I have no memory; I am absolutely devoid of sense and I ain't even got no mind."

Although their oath bound the Night Riders not to "use this order, or under cover of this order, do anything to a personal enemy for personal revenge", members of masked mobs were soon extending their operations to their own private feuds. They whipped several "undesirable" women at Olive Hill, Kentucky, gave Edwin Brown, a wealthy bachelor of Richmond, two weeks time to get himself a wife, and forced the management of the Lexington Opera House to substitute a performance of "Rip Van Winkle" for a play called the "Night Riders". In the western part of the state, there were tragic "nigger chasings" and at Tennessee's Reelfoot Lake there was night riding, whippings, and murder over disputed fishing privileges.

Retribution Comes Slowly

Augustus E. Willson became Governor of Kentucky in December, 1907, on a pledge to bring peace in the tobacco war. But he soon found that was more easily pledged than produced. The situation had become serious now throughout the Burley Belt as well as in the Black Patch. The burley growers were organized in the Burley Tobacco Society which was a branch of the then nationally prominent Society of Equity.

A prominent non-Association, non-Equity grower was urging farmers to "use very little fertilizer but a great many Gatling guns if they wish to make a good crop this year," and Willson apparently was prepared to furnish the guns. He infuriated the Night Rider sympathizers by sending units of militia into action without request from local officials.

Bracken County, on the Ohio River, about fifty miles east of Covington, was one of the hotbeds of Rider activity in the burley section. A number of whippings had taken place there in the spring of 1908 and two of the victims in particular, Lewis Kinney, a farmer and Robert Staton, a buyer (the burning of whose tobacco had been a big event in Brooksville, the county seat), set up a cry that was heard distinctly in Frankfort.

Willson dispatched his soldiers, who were received with the same hospitality as invaders from a foreign land. Storekeepers refused to sell them supplies. Few landowners would rent them camping ground. George Kinney, a relative of the whipped Lewis, incurred the wrath of his neighbors by letting them camp on his farm. An alert and aggressive attitude on his part kept the Riders at a distance, but they finally burned his barn—three years after the trouble had subsided and he had relaxed his guard.

The Crecelius Tobacco Law was passed early in Willson's administration, making

Bale up to 7 tons an hour with a "66" P.T.O. and a 2-plow tractor! Model shown with Hydraformatic bale tension control, optional at extra cost.

Here it is! A machine to make P.T.O. baling practical – *for only* $1457.25*!

Famous engine-powered "66" twine-tie operates with a one-plow tractor. Bales all varieties of hay, coarse or light, green or cured. Costs $1665. (See PRICE NOTE below.) **For trouble-free baling**, buy New Holland Twine. It's certified by the U. S. Testing Co. for full strength, full quality, full length.

*PRICE NOTE: Suggested list price, F.O.B. Factory: —plus Federal tax on tubes and tires

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HERE at last is real performance for the farmer who wants a P.T.O. baler—big capacity, square, easy-feeding bales, dependable operation . . . all from minimum power!

This P.T.O. model has all the proven features that have made the amazing "66" twine-tie. Feeding and baling action with horizontal wadboard build firm, even bales every time.

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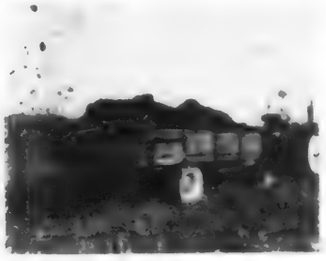
CUT TIME AND COSTS—The Farmhand 6-ton "Power-Box" with Spreader attachment has the operating capacity of *four* ordinary spreaders, makes spreading distant fields easier, less expensive. It spreads a 9 to 12-ft. swath, with controlled unloading speeds of 2 to 6 minutes per load. PTO powered, with smooth worm gear driven roller chain conveyor. Can be mounted on truck, trailer or wagon. Treated marine plywood bottom and aluminum sides resist manure acid, outlast steel.



FITS ANY FARM—The lower-cost 4-ton "Power-Box" has the same basic features as 6-ton model, with smaller capacities and with plywood sides. Both self-unloading "Power-Boxes" are easily converted to Forage or Silage Units, Mechanical Feeders or All-Purpose Boxes.

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it an offense for a grower to sell tobacco he had pledged to any association, or for any buyer to purchase it when he knew it had been so pledged. The penalty for violation was a $250 fine. At the same time, Tennessee passed a similar act known as the Triple Damages Law. Then Willson proceeded to increase his unpopularity with the Association people by implying that he would pardon any violator of the law who could show that he had been forced into pledging his crop. On top of this he pardoned Walker Duncan, who had been charged with the killing of Newton Hazelett, a Night Rider.

The Riders continued to poison livestock, destroy equipment —one of their neatest tricks was concealing dynamite in wheat shocks to blast the threshing machine to bits—whip and shoot independents, burn barns and warehouses, and though they frequently threatened to conduct a hanging, this, as James O. Nall, the historian, notes, was the only threat they failed to carry out.

The Weaker Sex

There is no telling how long this state of events might have prevailed if it hadn't been that the Night Riders picked on the wrong family one night in Caldwell County, Kentucky.

Robert Hollowell had never signed up with the Association and had made some derogatory remarks about the Riders. His wife, Mary Lou, had been even more careless in what she said. Furthermore, the two Hill Billies mentioned earlier as having been convicted of scraping plant beds were tenants of the Hollowells, and Mary Lou was alleged to have ordered the scraping.

So it wasn't surprising that one spring night in 1907, the Night Riders paid a visit to the Hollowell place, shot up the house, shot and kicked Mary Lou, severely whipped Robert, terrified their young son, Price, and ordered them to leave the county.

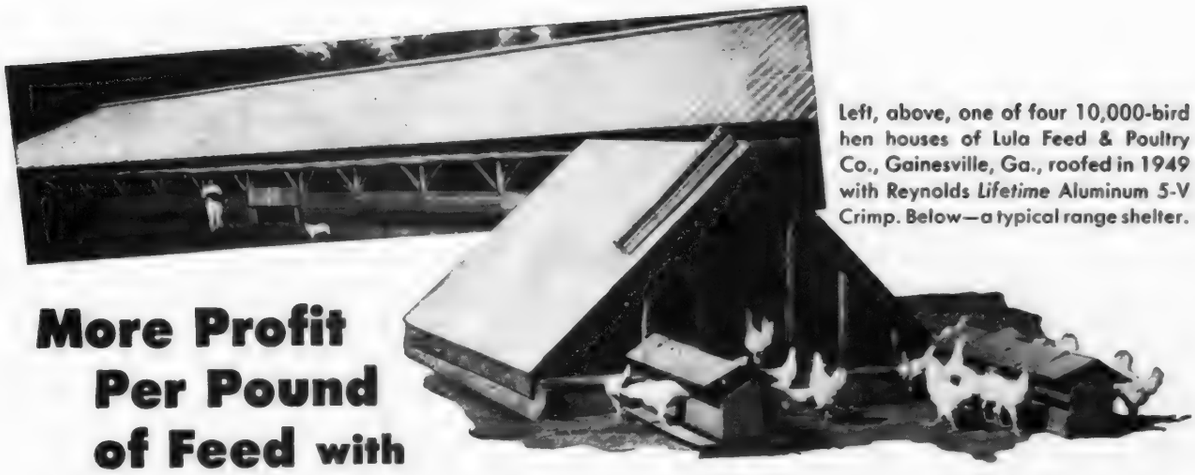
The next morning the Hollowells followed instructions, eventually settling at Evansville, Indiana. Robert, apparently, was a thoroughly beaten and terrified man. But his wife, against whom an indictment had meanwhile been brought for plant bed scraping, was determined to have justice. John Miller, the Paducah attorney to whom she took her case, filed three separate civil actions for damages, one for each of the family, against thirty individuals whom they were able to identify definitely as having been in the raiding party. As the Hollowells were now residents of a different state, the cases were filed in Federal Court, a procedure that had apparently never been thought of before in dealing with the Night Riders, and one that caught them completely off guard.

There were numerous threats as to what would happen to the Hollowells, particularly Mary Lou, should they ever set foot in Kentucky to prosecute their cases; but spunky Mary Lou couldn't be bluffed. Robert's suit for $50,000 damages came to trial at Paducah, in April, 1908, and ended with a hung jury, ten for the plaintiff and two against. The Night Riders, it was proven later, had been able to infiltrate even a Federal jury.

In May, the case came to trial again, this time with a jury brought from the neighborhood of Louisville, and Hollowell received judgment for $35,000. While this judgement was eventually compromised for considerably less, this was the case that broke the Night Riders. Not only had their secrets been revealed and their leaders identified by certain witnesses in the courtroom, but there immediately broke forth such a flood of suits by other victims who moved to neighboring states that night riding became, as Nall expressed it, "the most expensive form of lodgework ever indulged in by any organized group of farmers."

There were still a few scattered raids like the one at Winchester in the middle of June, 1908, when a band of Riders destroyed the plant beds of a cigar dealer. The most notable feature of this event was the concluding paragraph of the story the *Lexington Herald* carried the next day:

> **"None of the citizens of the city heard the band ride into the city or out. This is explained by the fact that all the men of Winchester were in Lexington yesterday attending the Democratic Convention and slept unusually sound after the long and exciting session of last night."**



Left, above, one of four 10,000-bird hen houses of Lula Feed & Poultry Co., Gainesville, Ga., roofed in 1949 with Reynolds *Lifetime* Aluminum 5-V Crimp. Below—a typical range shelter.

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☐ 26' x 60' Pole Cattle Shed	1.00	☐ 12' x 20' Sectional 4-Saw Farrowing House	.25

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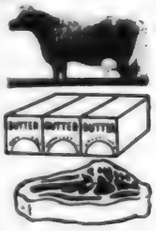

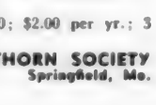

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Then, in November, the American Tobacco Company made a deal with the Burley Tobacco Society for the bulk of the 1906 and 1907 crops at a price of more than 17 cents.

In 1909 the Six Cents Tax was repealed and the Crecelius Law was declared unconstitutional; and the following year the Supreme Court, after long litigation, ordered the dissolution of the Trust. Within five years the Planters' Association, too, was dissolved and all was peace, for a time at least, in the Black Patch and the Burley Belt.

With the introduction of the tobacco production and marketing provisions of the Agricultural Adjustment Act of 1933 and the Soil Conservation and Domestic Allotment Act of 1936, the federal government stepped in and has since administered production and prices in such a manner as to make a recurrence of the Night Riders episode a practical impossibility. No matter how painful they may be, production controls operate today without violence.

THE FLOWERS OF SPRING

(*Continued from page* 63)

Dead leaves should remain on the ground where they are. They are the mulch or protection which nature gives to woodland plants. Eventually they rot and become the humus on which the plants depend for nourishment.

Plants which are to be moved from one location to another should be dug up with plenty of soil protecting the roots, packed in damp newspaper and kept moist. If they cannot be transplanted immediately, they should be placed in a cool, shady spot and watered. Re-planting usually presents no difficulties if the hole is well watered before the plant is set in and the earth kept moist for several days until the plant is established in its new home.

If wild flowers are bought from a nursery they usually come as roots or bulbs, ready to put in the ground. October or November is probably the best time to bring in the newcomers for they will acclimate themselves to their new habitat over the winter and blossom at their appointed time the following spring. Planting depth for roots can be supplied by the nurseryman. Seeds should be sown and firmed down lightly. A burlap cover over the winter will protect them from extreme cold or heavy rains. This can be removed in April.

Once established, the wild garden will grow and become an ever-increasing source of pleasure. Each year there will be the pleasure of welcoming nature's own wild blossoms in the early spring days.

THE AUTHOR: Senior member of the firm of Gottscho-Schleisner, Architectural Photography, Samuel H. Gottscho started his business career as a traveling salesman. Thirty years ago he turned his hobby into his profession and has since devoted his life to photography. His work has appeared in many magazines devoted to architecture and gardening. He is the author of the book, "Wildflowers, How to Know and Enjoy Them."

NEW WAYS TO USE NITROGEN

(*Continued from page* 35)

of application depends entirely upon the needs of the crop. Generally it is suggested that 20 to 25 pounds of nitrogen be given to wheat, 40 to 60 pounds to grasses and 50 to 100 pounds to corn, potatoes and sugar beets. These recommendations, please note, are in terms of pounds of nitrogen per acre. To reduce this to gallons of Uran simply divide by the conversion factor 3.5. For example, if it is intended to apply 50 pounds of nitrogen per acre, 50 divided by 3.5 equals 14.3 gallons of Uran that must be applied to give the required amount of nitrogen. (If you would like to check yourself on such a calculation do it this way: Multiply the number of gallons determined—14.3—by the weight of a gallon of Uran—10.85 pounds. This gives 155.155 pounds. Multiply this figure by 32 per cent (nitrogen content of Uran) and the answer is 49.649—close enough to 50 pounds to satisfy even the most scrupulous farmer.)

Then, since the standard spray charts used to determine nozzle size, pressure and speed are based on the use of water, another adjustment is necessary to regulate the flow of the Uran. This can be done in two ways: (1) by multiplying the number of pounds of nitrogen required per acre by .328 (50 × .328 equals 16.4 gallons); or (2) divide the determined number of gallons of Uran by .875 (14.3 divided by .875 equals 16.34 gallons). The setting on the sprayer would then be made at 16.4 and the required 14.3 gallons of Uran would be delivered.

Even after all this arithmetic, the operator would do well to check himself by spraying an acre and measuring the amount of the solution used.

It is always recommended that low pump pressure and larger nozzles be used rather than stepping up the pressure. Too much pressure will cause drifting of the material to spots where it isn't wanted.

Current price of Uran is $96 per ton, that's just exactly 15 cents per pound of nitrogen. That means that 100 pounds of nitrogen applied in this form will cost the farmer $15 plus the cost of application, probably another dollar or dollar and a half per acre.

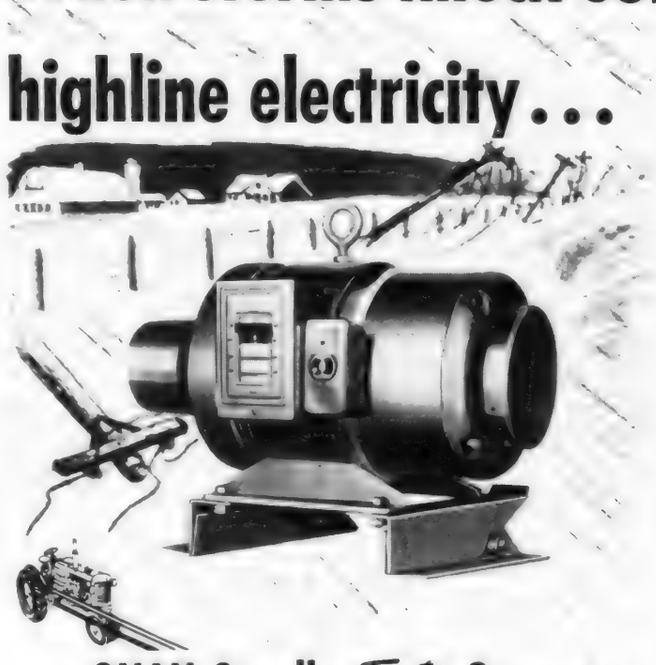
One of the big advantages Uran offers over anhydrous ammonia is that it can be applied by airplane. One thousand acres of wheat were top-dressed with the solution at Orleton Farms, London, Ohio, in 1952 and again last spring. William Redeker, the pilot who did the work, put on six gallons per acre, or a little more than 20 pounds of nitrogen. The plane carried an average load of 60 gallons and covered 50 acres an hour, a pace that kept a couple of tank trucks busy hauling the material to the landing strip. Aerial application charges run from $4.50 to $5.50 per acre including the cost of the Uran and the trucking charges.

As was mentioned before, Uran can also be applied by feeding it into sprinkler irrigation systems. Recommendations here are to use a ratio of one part of Uran to 25 to 50 parts water: run the sprinkler for about 15 minutes before feeding in the Uran and for another 15 minutes afterwards so that none of the fertilizer remains on the foliage.

The big drawback to the use of Uran is its corrosiveness. All nitrogen compounds are corrosive, as any experience with a left-over bag of nitrate of soda will confirm, and Uran is no exception to this rule. Any farmer who uses the stuff in his sprayer will have to give his equipment a thorough flushing immediately after each use; and he'll have to reconcile himself to a short life for his nozzles and other parts unless he replaces them with stainless steel or chrome-plated fittings. Steel storage tanks and spray tanks will stand up fairly well. Pumps and nozzles of brass or bronze will corrode so badly that their use isn't practical.

Tryco Sprayer Co., Decatur, Illinois: Ken-Standard Corporation, Evansville, Indiana: Power Aire Co., Omaha, Nebraska; Standard Steel Manufacturing Co., Indianapolis, Indiana: Broyhill Equipment Co., Dakota City, Nebraska; and Century Equip-

When storms knock out highline electricity...



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When electricity is interrupted, nothing works *except you!* You lose time, and if it happens during milking, you lose milk production too.

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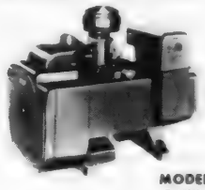

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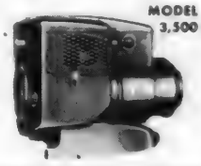

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WRITE FOR LITERATURE

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PRODUCTS

ment Corp., Cedar Rapids, Iowa, are among the sprayer manufacturers who have adapted their equipment to handle Uran.

Low Pressure Liquids

There are other nitrogen-carrying liquids, all of which require storage and handling under pressure because of the volatile nature of their components, but they are not being used to any great extent on the farm. Mostly they are being used by manufacturers of mixed fertilizers to add nitrogen to their formulas.

There are a number of low pressure forms, for direct application, of various nitrogen content which are being manufactured, but are not now in sufficient supply to be readily available. Many manufacturers are equipped to make these compounds which will come on the market as demand develops. Because these compounds must be kept under pressure (as low as 10 pounds per square inch) they have to be injected under the surface of the

HOW MUCH NITROGEN CAN I AFFORD TO USE?

Gross Profit per Dollar Spent for Nitrogen

Pounds of nitrogen used per acre							Price of corn per bushel
160	1.19	.82	.56	.37	.22	.09	
120	2.50	1.92	1.50	1.19	.94	.75	
80	5.12	4.11	3.37	2.83	2.40	2.56	$1.75
40	8.19	6.66	5.56	4.74	4.10	3.09	
160	1.00	.67	.43	.25	.11	.00	
120	2.00	1.67	1.28	1.00	.78	.60	
80	4.60	3.67	3.00	2.50	2.11	1.80	$1.60
40	7.40	6.00	5.00	4.25	3.67	3.20	
160	.81	.51	.29	.13	.01	–.19	
120	1.90	1.42	1.07	.81	.61	.45	
80	4.08	3.23	2.62	2.17	1.82	1.54	$1.45
40	6.61	5.34	4.44	3.76	3.23	2.81	
160	.62	.35	.16	.02	–.10	–.19	
120	1.60	1.17	.86	.62	.44	.30	
80	3.55	2.79	2.25	1.84	1.53	1.28	$1.30
40	5.82	4.69	3.88	3.27	2.79	2.41	
	10	12	14	16	18	20	

Cost of nitrogen per pound

This table, prepared by Paul R. Robbins, Department of Agricultural Economics, Purdue University, shows the return to the farmer per dollar of nitrogen applied to corn at varying relationships between the price of nitrogen and the price of corn. It assumes that the first 40 pounds of nitrogen applied will produce an increase of 21 bushels; that the next 40 pounds will return an additional 14 bushels; the third 40 pounds, an additional 8 bushels; and the last 40 pounds, an additional 5 bushels.

The yield data on which the table is based were taken from trials on Crosby and Brookston soils in Indiana during the years 1944-49.

To use the table locate the price at which you expect corn to be selling in the extreme right hand column. Then find the price at which you can purchase nitrogen in your community and read up that column until you come to the group of figures opposite the corn price. Select the pounds of nitrogen per acre you intend to use in the extreme left hand column and read across the line until you reach the column indicated by the price of nitrogen selected. The figure will indicate how much of a return each dollar spent for nitrogen will bring you.

For example: You are thinking of putting on 80 pounds of nitrogen, which will cost you 16 cents per pound, and you expect corn to be worth $1.45. Read up the 16-cent column until you come to the group of figures adjacent to $1.45 in the right hand column. In the left hand column find the figure 80 adjacent to the same group of figures. Read that line over to the 16-cent column and you will get a figure of $2.17, the potential return for each dollar spent for nitrogen.

ground with the same kind of knife-like applicators as are used with anhydrous ammonia.

The Solid Forms

Regardless of the efficiency and the ease of application of the new gaseous and liquid forms of nitrogen fertilizers, the great majority of Mid-west farmers will still be using a solid form this year—some because of their long experience with it, others because they will find it impossible to get either of the newer types. It seems probable that the supplies of anhydrous ammonia and ammonium sulfate will increase. This is problematical in the case of the solutions.

A run-down of the dry forms includes the following:

Ammonium nitrate. One of the old dependables with a nitrogen content of 33 per cent. Half of its nitrogen is in ammonia form and as such isn't subject to rapid leaching. It has an acid effect on soils that can be neutralized by using about 60 pounds of pulverized limestone to 100 pounds of the ammonium nitrate.

It is fine for top dressing wheat or other small grains and grasses in the spring and for side dressing corn. In prilled form it is an excellent medium for airplane application.

Ammonium nitrate is the one type of nitrogen fertilizer that is flammable. For that reason it should not be stored near combustible materials and care should be taken not to smoke around it.

Cost at present runs anywhere from $80 to $110 a ton, or 12 to 17 cents per pound of nitrogen.

Ammonium Sulfate. Another old timer of somewhat lower nitrogen content—21 per cent. It is a by-product of the coke oven and is produced by combining ammonia with sulfuric acid. The soil bacteria reduce the ammonia of the combination to a nitrate form which is used by the crop and a residue of sulfuric acid is left in the ground producing an acid effect. This is considered highly beneficial in helping to reduce scab in potatoes.

The sulfate is a good material for plowing down for corn or for side-dressing and is also widely used for top-dressing small grains and grasses.

At the current price of $60 to $80 per ton the cost of nitrogen in this form is 14 to 20 cents per pound.

Sodium nitrate. The oldest and still one of the most popular forms of nitrogen fertilizers. Its 16 per cent nitrogen is very soluble and gives quick results. It is recommended for top-dressing small grains and grasses and for tobacco, but should never be used on potatoes, since its soil reaction is decidedly alkaline and may encourage scab.

At $75 to $85 a ton an application of

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Steady income, secure future. There's real independence for men who own a herd of registered Guernseys. Walter and Harlan Jones point to last year's income of $15,397 over feed costs. This represents milk sales from only 33 head. Within a year or two, they plan to milk 50 to 60 purebred Guernsey cows at Royal Acres Farm.

Greater profits will be made each year. This father-son team is gradually feeding less grain and more good grass and ensilage. The Jones' have found Guernseys most efficient producers of premium GOLDEN GUERNSEY Milk on a ration based on home-grown roughages.

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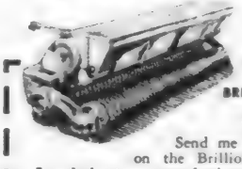
Brillion
SURE-STAND GRASS SEEDERS



BRILLION IRON WORKS
Dept. SG-3-3
Brillion, Wisconsin

Send me complete information on the Brillion Sure-Stand Seeder.
I seed about.....acres for hay and pasture each year.

Name.....

Town.....RFD.....

County.....State.....

nitrogen in this form costs from 23½ to 26½ cents a pound.

Calcium cyanimide. This one contains 20 per cent nitrogen and the equivalent of 70 per cent hydrated lime. Its nitrogen is released in the form of ammonia and is not readily available. Because of its high calcium content it is excellent as a pre-planting application on grass sods or non-legume cover crops. It is another one that should not be used for potatoes where there is danger of scab. While it can be used to advantage as a plow down for corn and as a top-dressing on small grain and grass, the application should be made at least a week before planting corn and very early in the spring on the grains and grass, since cyanimide is toxic to seeds and foliage.

Calcium cyanimide is currently selling at $85 to $92 a ton, making the cost of a pound of nitrogen 21 to 23 cents.

Urea. One of the newest of the dry nitrogen fertilizers. With its nitrogen content of 46 per cent it is also the most concentrated of the dry forms. On being applied to the soil its nitrogen rapidly changes to the ammonia form. It is an excellent fertilizer for corn, either as a plow down or for side-dressing and it is equally good for top-dressing small grains and grasses. Its one drawback is that it is very difficult to keep in good physical condition as it is very hydroscopic. This has been overcome, however, by putting the urea in prilled form. Du Pont's Nu-Green is one of these prilled ureas. A little nitrogen has been sacrificed in the process, but Nu-green is still a 45 per cent fertilizer, twice as potent as either ammonium sulfate or calcium cyanimide and much easier to handle. For airplane application it is ideal and since it is very soluble in water it can also be dissolved and applied as a spray.

Its price sounds fantastic—$145 to $155 a ton. Buts its high nitrogen content enables it to deliver a pound of nitrogen at a price well in line with its competitors—16 to 17 cents.

Which to Use?

The choice as between the various nitrogen carriers will be for most farmers a matter of price, convenience of application, and the materials available in his community. If only one or two are offered in his territory his choice will be drastically limited. If he happens to be located in a veritable fertilizer super-market where he can buy anything from soda to anhydrous he can compare prices and do a good job of buying. The point to remember is that it is the price per pound of

All purpose . . . low cost

SPRAYER

Here are six reasons why farmers who own Century's "A-1" sprayer say it's the best low gallonage boom sprayer at any price:
(1) Faster, easier mounting. **(2)** Adjustable row spacing from 36 to 40 inches. **(3)** Four, six or eight row hinged booms. **(4)** PTO drive pump. **(5)** Solid cone nozzles. **(6)** Tractor seat control of pressure, flow and boom adjustment.—Prices start at $143.50, f.o.b. factory.

Handgun Sprayers from $82.50
Boomless Sprayers from $76.80

Write for Century's complete catalog of handgun, boom or boomless sprayers. The finest sprayers on the market.

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Cedar Rapids, Iowa

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HIGH QUALITY
at a price you can afford

RIDING EQUIPMENT
Riding equipment for farm use, pleasure and show. English and Western saddles, bits, bridles, spurs. Stable blankets. Girths, Caveson sets. Other horse equipment.

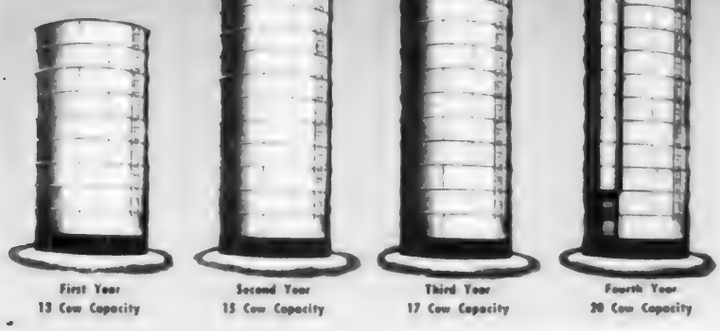
HALTERS
Baby beef, cow, calf or bull show halters. Complete selection of stockmen's supplies. Cow blankets in all sizes.

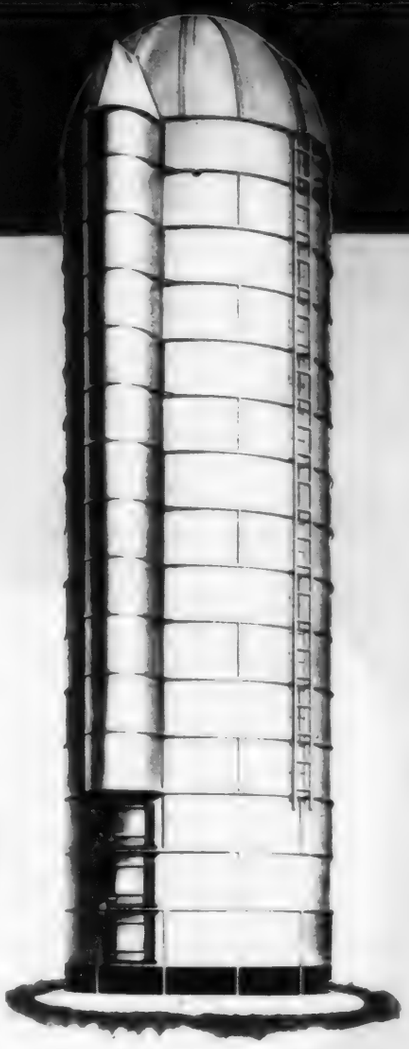
OTHER BOYT ITEMS

Ever since 1901, Boyt has been making the strongest work harness in America. Also available are horse collars, body belts, tarpaulins, hunting and fishing equipment, and many other items of particular interest to the farmer and sportsman.

FREE CATALOGS — Leading harness, hardware and implement dealers feature Boyt items. Three catalogs available. Specify whether interested in farm items, sporting goods or riding horse equipment. Write The Boyt Co., Dept. L., Des Moines, Iowa.

BUY THE SILO THAT CAN *GROW* with your needs!

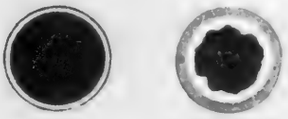




C&L SILVER SHIELD

ALL-STEEL Zinc-Coated SILOS

Practical! Adaptable! Economical! You buy just what fits your present requirements, as your herd grows, so can your C & L Silver Shield Silo, by simply adding rings to increase height — a common sense solution to most silage problems

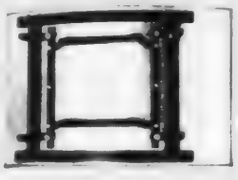


Airtight Steel Eliminates All Spoilage

Porous Walls Cause Outer Ring of Spoiled Ensilage

NO WASTE!

Ensilage from a steel walled C & L Silver Shield Silo is good to the last forkful. There is never an outer ring of spoilage, because C & L Silver Shield Silos are completely air tight.



PLENTY OF CONVENIENCE!

Thirty inch section height allows larger doors — a feature that makes it easy to pitch silage out

EASY TO ERECT!

Economical too! All parts are factory fabricated to match accurately. Whether you do it yourself, or have it done, erection time and cost are cut to a minimum

Leak Proof • Wind Proof
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CLAYTON & LAMBERT MFG. CO.
Middletown, Ohio

Please send me catalog giving complete information about C & L Silver Shield Silos

Name_____

Address_____

City State

CLAYTON & LAMBERT MFG. CO.

C&L SILVER SHIELD SILO

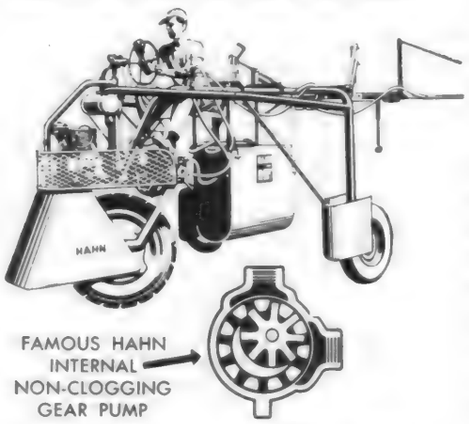
MIDDLETOWN, OHIO

Use HAHN HI-BOY

AMERICA'S HIGH CLEARANCE SPRAYER

Sprays Better at less Cost

There is a reason for the increasing demand for the self-propelled Hahn Hi-Boy—farmers everywhere are discovering they can save spraying time because the Hahn Hi-Boy is fast and efficient—and they can save on spray costs because the Hahn Hi-Boy puts the spray where it's needed with practically no waste—and it's quality built for long trouble-free service. First in the field and still the leader.



FAMOUS HAHN INTERNAL NON-CLOGGING GEAR PUMP

Scientifically built frame of rigid tubular steel—8¼ H.P. air-cooled engine, automatic centrifugal clutch, boom available in 3 sizes at 14', 20', 28'. Adjustable from 18" to 8' from ground—frame clearance 72". 100 gallon tank—automotive steering—self-propelling—3 speeds forward, one reverse—all controls within easy reach of operator—low center of gravity—with the famous Hahn internal gear pump.

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HAHN HI-BOY

THE HI-SPEED SPRAYER

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HAHN TRACTOR MOUNTED SPRAYERS

BRUSH CONTROL UNITS • TRAILER SPRAYERS

nitrogen that is the all-important factor, not the price per pound or per ton of the carrier. For example, the fact that a urea compound sells for $150 a ton while sodium nitrate can be bought for $75 doesn't mean much. It's the comparison between the 16½ cents per pound of nitrogen in the urea and the 23½ cents per pound in the sodium nitrate that will cut fertilizer expenses.

Watch that Balance

While the effect of nitrogen is spectacular, the farmer should never forget that his increased yields are taking more phosphorous, potash, calcium and other minerals from the soil and he should exercise every care to see that these are replaced.

One fertilizer expert puts it this way—"The fellow who is always filling his gas tank and never checks his oil is headed for trouble. The same is true of the man who uses more and more nitrogen fertilizer and forgets the other elements."

If you still have your copy of THE FARM QUARTERLY for last Summer handy, you might take another look at the article on page 30, "Wheat Roots Tell a Story." There we emphasized the fact that all crops must have balanced nutrients and that if any one of the essential elements is missing, plant growth is going to suffer.

The Missouri experiment station has found many instances in which failure to obtain response from nitrogen has been traced to low levels of phosphorus, potassium, or magnesium. In one instance, corn following soybeans cropped for hay produced only 48.5 bushels even though the crop got 200 pounds of nitrogen. The available potassium in the soil had been pulled way down. When it was brought up to adequate levels, the corn yield jumped to 118.5 bushels.

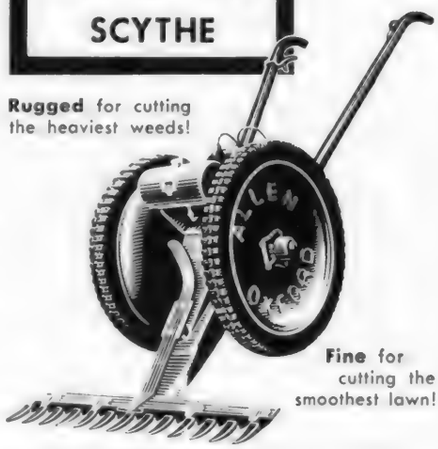
Tobacco growers are aware that too much nitrogen will delay housing and increase the nicotine content of the leaves. They have been advised to give their crops just enough nitrogen so that the plants will be starving for it at the end of the season.

It's no news either that serious lodging in small grains can be caused by an imbalance of nitrogen. A 50 bushel crop of wheat needs about 85 pounds of nitrogen, but that much could cause serious damage if other plant elements are out of line.

THE AUTHOR: Ellis Rawnsley is editor in charge of the Ohio and Indiana editions of *The Cincinnati Times-Star*, a job that keeps him in close contact with farming affairs in those two states. Born in England, he came to this country with his parents in 1920, started his journalistic career in New Jersey and worked for the Associated Press in that state, Pennsylvania and Ohio. He lives in the village of Terrace Park, east of Cincinnati, where he does some commercial cut-flower growing in the hours he is free from his typewriter and says he "likes to dabble in such things as growing plants under fluorescent light."

THE ALLEN SCYTHE

Rugged for cutting the heaviest weeds!



Fine for cutting the smoothest lawn!

Gets close into corners; turns easily—the large wheels keep rolling where small wheels slip. Cutting height always controlled. 3 hp engine, cutting widths 24", 36" and 48".

See your nearest Dealer or write for facts!

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NITRO SHOOTER UNIVERSAL with BLUE Metering Pump

This new popular type of Anhydrous Ammonia trailer type applicator is ideal for your pasture land. We also make lighter weight trailer units and tractor mounted applicators for Anhydrous Ammonia and Nitrogen solutions.

Fertilizer or Side Dressing

BLUE Tractor Fertilizer Distributor

Speedy-Accurate Trouble Free

Here is the way to higher crop yield at small cost. This distributor can be quickly mounted on all standard tractors.

Dependable Farm Equipment Since 1886

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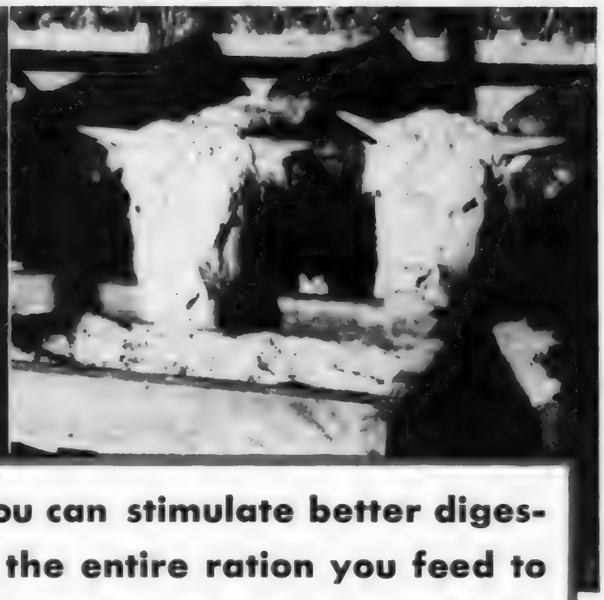
Huntsville, Ala.

New way to cut down feed waste

INSIDE YOUR CATTLE!



Now you can stimulate better digestion of the entire ration you feed to cattle—with quality feeds containing ARCADIAN* Urea Feed Mixture!

Cattle feeding efficiency today centers around the new idea of balanced feeding for the bacteria or "bugs" in each animal's rumen or first stomach. For these bacteria break down and convert the ration into nutrients the cattle can digest for making low-cost meat and milk.

To operate the "fermentation vat" in the rumen at a fast and efficient rate, these bacteria need protein and energy to grow and multiply fast. They grow faster if part of the nitrogen for protein comes in the quickly-available form of ARCADIAN Urea Feed Mixture—and also if some of the energy is in quickly-available form such as the starch of grain or the sugar of molasses.

When you spark rumen activity by balanced feeding of the rumen bacteria for faster growth, they do a better job of breaking down the mass of feed in the rumen. They break down more of the cellulose and other fiber in roughage and grain to make it digestible. This also releases more of the nutrients inside the fibrous cell walls of most feedstuffs.

High-quality cattle supplements, in addition to feeding the rumen bacteria, must also supply other essentials for the cattle. These include calcium, phosphorus, Vitamin A and certain other nutrients, plus additional protein and energy. The rumen fermentation supplies the B-Vitamins. So you can see that the heart of a modern "balanced" cattle supplement is quickly-available energy plus the quickly-available source of protein – ARCADIAN Urea Feed Mixture.

Beef herds on range, dry pasture or protein-poor hay do better when they get a balanced supplement with urea. ARCADIAN Urea Feed Mixture not only feeds the rumen bacteria fast, but is also a highly-concentrated source of protein. This makes room in the concentrate for extra minerals, vitamins and energy to balance the roughage, so you get better growth, better wintering and a more vigorous calf crop.

Feed lot cattle, too, make more efficient gains when their ration includes ARCADIAN Urea Feed Mixture to speed digestion.

Dairy cows need good roughage and high-energy supplements to maintain high milk production and to produce strong calves. You can keep their rumen activity at top level by using as little as 5 to 15 pounds of ARCADIAN Urea Feed Mixture per ton of concentrate as fed. You can get Urea in regular dairy rations or in mixing supplements for use with home-grown grains.

To get these major benefits, look now for high-quality feeds and concentrates containing ARCADIAN Urea Feed Mixture.

Arcadian

UREA FEED MIXTURE

Experiment stations and farmers have proved that feeds containing urea give you two major benefits: high-quality supplements, and extra feed value from the entire ration including the roughage. See your feed dealer today for feeds containing ARCADIAN Urea Feed Mixture. Ask him also for free booklets on how it works.

*Trade-Mark

NITROGEN DIVISION, Allied Chemical & Dye Corporation
P.O. Box 98, Ironton, Ohio. Telephone: Ironton 8-4366

NITROGEN DIVISION ALLIED CHEMICAL

IRRIGATION Will Pay Off In the Midwest

Continued from page 48)

trained people away from the colleges and training their own men to fill the growing demand of the farmers. They offer their services free as part of the cost of selling equipment and if a farmer doesn't take advantage of the service he just isn't getting his money's worth.

The Sprinkler Irrigation Association says, "When an irrigation system is planned by a dealer, he assumes full responsibility for the proper design of the system and should issue a warranty stating the performance expected for water application rate, capacity, and the rate of coverage for a specific area serving specific crops. Where the purchaser buys the system piecemeal, he absolves all dealers of responsibility for the performance of the system as a unit."

A farmer who is in the market for an irrigation system would do well to get in touch with the various dealers in his area and let them show him plans and bids on the project. If he doesn't happen to know who the dealers are he can find out by writing to the Sprinkler Irrigation Association, 1028 Connecticut Ave., N.W., Washington 6, D. C., or the Aluminum Company of America, 1120 Alcoa Building, Pittsburgh 19, Pennsylvania, or to the Irrigation Market Manager, Reynolds Metals Co., 2500 South Third St., Louisville 1, Kentucky. Since these two companies manufacture practically all the irrigation pipe in use today they keep a list of irrigation equipment dealers in all parts of the country.

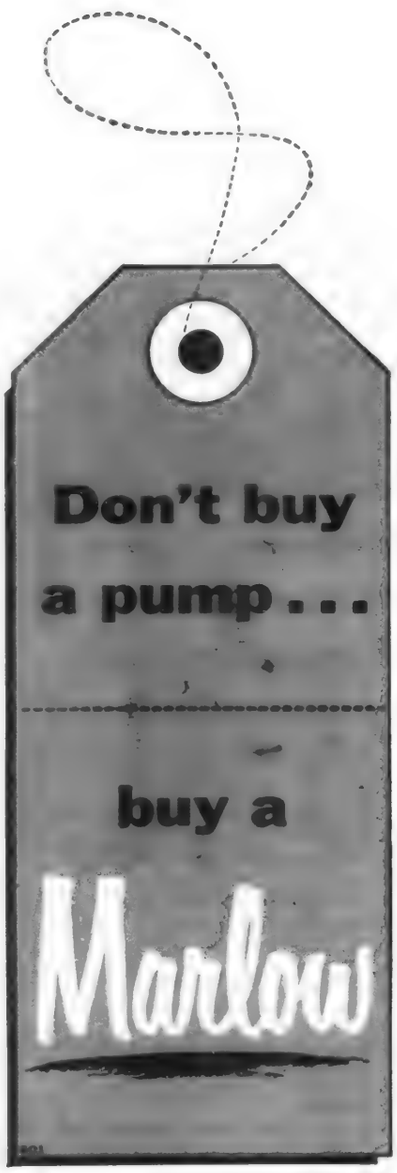
The irrigation engineer usually follows this procedure in assembling the facts and setting up the system:

1. The water source is checked to make sure that there is enough water during the season to operate the system. As a rule, the engineer will take no responsibility for well drilling or pond building though he will be a good source of information about these matters.

2. Aerial photographs are consulted and a map of the farm is made showing the fields to be irrigated, the source of the water, and the slope of the land. This last item is necessary in figuring the amount of pressure to push the water to the fields and the amount of water that can be applied without runoff.

3. The crops to be irrigated are then considered. Each crop has its own water requirements and each affects the amount of water that can be applied without eroding the soil. Corn, for example, is usually watered at silking and at tasseling time with enough water to wet the soil to a depth of 24 inches in heavy to medium soils and to 36 inches in sandy soil. Tobacco is watered at transplanting and at topping time. Alfalfa is usually watered after each cutting and pasture is watered after it has been grazed down and the animals moved. A general rule is that most crops make their heaviest demands on soil moisture at fruiting time. The rate of water application will depend on the soil type, but a cultivated crop like corn can take only about half the water that a cover crop like alfalfa can absorb on the same soil.

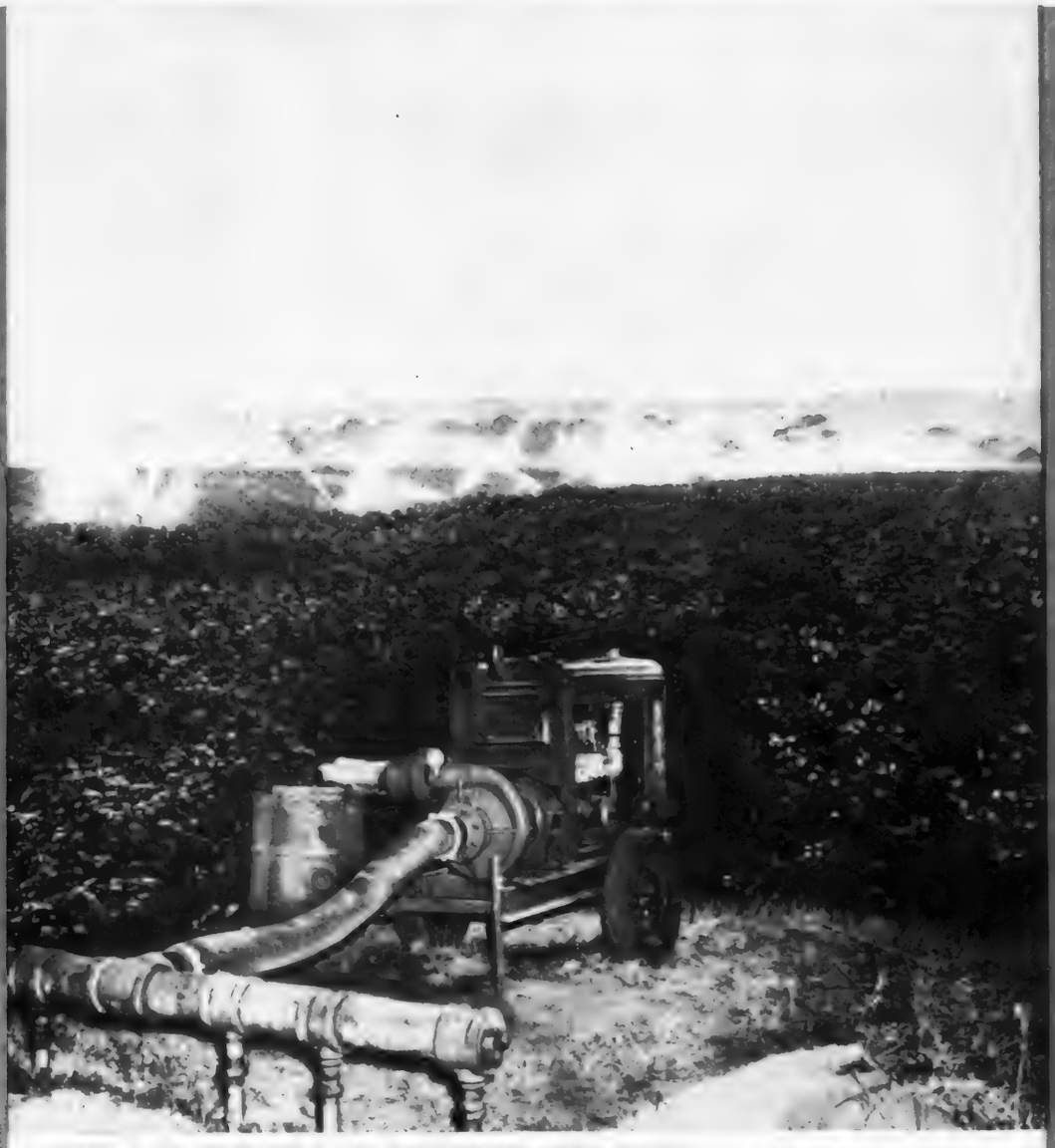
4. The soil type is studied to determine the amount of water that can be safely applied. This may range from a maximum of two inches an hour on well



guaranteed
to
perform!

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY

THIS CONTRAPTION was thought up by a communist farm engineer in Rumania. The news release says it can be used for spraying or for irrigation. It is mounted on a crawler and apparently swings in a circle when in operation. Unanswered is the question how to keep it supplied with spray and or water.



OVER 400 BUSHELS OF POTATOES PER ACRE—that's the record set by practically every truck farm last year in Suffolk County, Long Island, during one of the worst droughts in history of the area. Portable sprinkler irrigation was the answer to double the normal yield. With a Marlow Centrifugal Pump as the heart of the system, operating at high efficiency and at low cost, both fields and crops were kept *green and productive throughout the entire growing season.*

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Marlow Irrigation Pumps are engineered and built specifically for sprinkler irrigation service, that's why Marlows combine top performance with economy and easy, trouble-free operation. Marlow makes a broad range of models to meet every sprinkler irrigation requirement. A wide choice of power units is available, including electric motors, gasoline, L.P.G. or diesel engines. See your Marlow dealer today or write for Bulletin SI-53.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY

Forecast local showers when you want them, where you want them, with Rain Bird Sprinklers. They're engineered to provide even distribution of water at less cost, less labor, and are famous the world 'round for their faultless operation.

To stop erosion, for higher crop yield, let Rain Bird solve your irrigation problems.

Be sure that the system you buy meets the minimum requirements for design, installation and performance of a sprinkler irrigation system, as approved by the American Society of Agricultural Engineers.

Our research and planning department is at your service. Consult us today without obligation.

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In this unique design, water pressure provides a watertight seal automatically —at both high or low pressures. No tools required. No hooks, latches or gadgets. Faster and easier to use, the McDowell Coupling saves time and money.

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WATER LINES INSTALLED *Quick and Easy!*
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PLASTEX *Measure Marked* T.M.
PIPE

Use this lightweight, flexible, corrosion proof pipe for drinking water, irrigation or drainage lines. Install it yourself in a jiffy . . . it's marked and measured every 10 ft. for extra convenience. Smooth surface gives greater flow, never collects scale, lasts a lifetime. Folder on request.

Ask for **PLASTEX** at your Hardware, Plumbing or Farm Supply

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"Do-it-Yourself" with PLASTEX

IT DOESN'T take a circus strong man to pick up three lengths of main line pipe and walk off with them. Aluminum pipe is only one of the new developments which are making irrigation a routine farm job.

drained sandy loam soil with a cover crop to two-tenths of an inch on poorly drained, heavy textured soil without cover. The amount of water a particular soil will absorb must be known to prevent erosion and waste from runoff.

5. The distances to be traveled by the main line to the fields and by the lateral lines with their sprinklers across the fields are then measured.

6. The direction of the prevailing wind and its usual velocity is then determined. Since the water is spread through the air, the wind will affect the pattern of the spray. The engineer will try to design his system so that the wind crosses the laterals, and space his laterals to take care of the change in pattern.

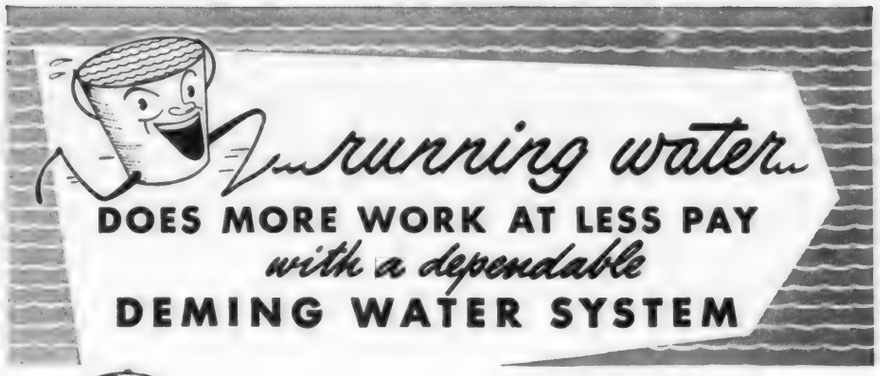
With this information, the engineer is ready to get out his slide rule and charts and start doing some careful paper work. He will figure the size of the sprinklers to use, the amount of water they will put out in gallons per minute, and the pattern of the water they throw. Then he will work out the spacing of the sprinklers along the lateral line to give at least a 50 per cent overlap. He then measures off the distance the lateral line may be moved at each setting and still give a 40 per cent overlap of water between lines, so that

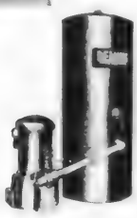
all parts of the field are covered. To make these findings he will have had to figure the nozzle pressure and match it with the proper sprinkler equipment. At this point he will be about ready to sit back, resharpen his pencil and take a deep breath before launching into the more complex part of the job.

Since the price of pipe goes up rapidly as the diameter increases, he will determine the smallest size for the main line and laterals which will do the job. Here he runs head on into the problem of friction. The smaller the pipe the greater the friction and as the friction of the water against the pipe goes up it takes a bigger pump and more horsepower to push the water through. He will consult many a chart that is so criss-crossed with reference lines and vectors that it looks more like material for a plaid shirt than an engineering document, before he comes up with the answer that will give the least expensive balance between pipe size and pump capacity.

In recommending the pump and the power unit to operate it, the engineer will have to take into consideration not only pipe size but amount of water to be pumped each minute, the pressure to be maintained at the sprinkler heads, the lift of the water from the well, and the extra pressure it will take to push the water to the fields if they are at a higher elevation than the water supply.

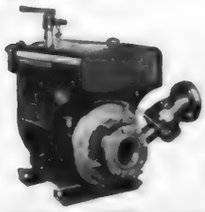
Since the pump and its power unit may





Efficiency and economy are engineered into the Deming Fig. 4963 Convertible Jet Water System (pictured at left). Pumps may be installed either over the well or a reasonable distance away. Capacities range to 2450 gallons per hour. Write for details.

The Deming Fig. 6700 Submersible is the best in its class. Entire pumping unit (including motor) submerged in well water. Quiet operation assured. Capacities range to 1500 gallons per hour. Write for details.



...and for IRRIGATION

The complete Deming line of irrigation pumps meets most demands for types, sizes, and capacities. Write for free illustrated bulletin No. 800-A.

DEMING — The Most Complete Line of Pumps for Farm and Home!

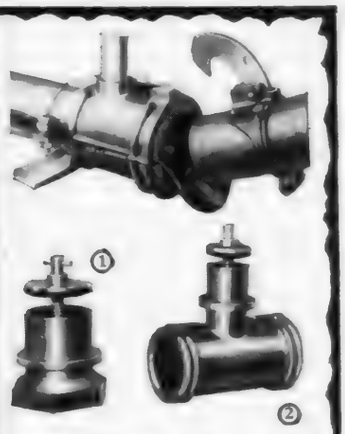
THE DEMING COMPANY • 510 BROADWAY • SALEM, OHIO

THIS COUPLER THESE VALVES
CUT IRRIGATION COST

A coupler that gives you more speed, ease, economy in handling, operating, and maintenance.

Valves that reduce flow resistance and completely eliminate surging.

Outstanding, exclusive new design features of Hardie Rain Control Portable Sprinkler Irrigation Systems make water go further, cost less. Strictly one-man operated. All aluminum construction. No complicated parts. Fits any ground. Entire system can be disassembled with a single wrench. Write for complete data about Hardie complete systems, pipe, couplers, valves, fittings, pumps, sprinkler heads, and Rain Control free engineering services available from Hardie distributors.



MONEY-SAVING COUPLER FEATURES

Two-bolt foot clamp provides attachment of coupler without punching, drilling or welding . . . Two-bolt ring clamp holds steel hook, providing positive lock and eliminating slippage with resulting pipe damage . . . No-blow-out gaskets automatically drain. Easily coupled and uncoupled without walking to coupler.

ULTRA MODERN VALVE DESIGN

The valves illustrated are: 1—Riser valve to make lateral connections to main line. 2 — A portable main line valve coupler. 3—Valve opening elbow used to open and close 1 and 2 together with connecting lateral lines to valves. There are many other Hardie Rain Control valves of exclusive, advanced design which provide operating ease and economy.

HARDIE Rain Control PORTABLE SPRINKLER IRRIGATION SYSTEMS

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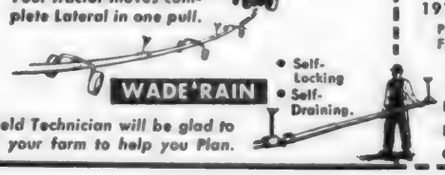

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run to a third the cost of the whole system, the recommendation of a pump is a matter that can stand considerable thought, if not downright fasting and prayer. Fortunately, the pump manufacturers issue accurate data sheets on each piece of equipment detailing its capacity and efficiency at different pressure outputs and at different power settings.

Before his job is done, the engineer will set up an operation schedule for the system, giving the amount of acreage to be covered at each setting of the laterals,

MAKING a new setting on growing corn is not as easy as on a pasture. One Indiana farmer is staggering his corn and clover crop strips, irrigating both from the clover.

the amount of water to be applied at a setting, the length of time each setting should be allowed to run, and the schedule for covering the crop. He will also be in a position to work out the cost of operation, which will depend on the size of the power unit needed and the labor costs involved in moving laterals.

Operating the System

Getting the most out of an irrigation system is a matter of adjusting its use to the soil and to the crops grown. Each type of soil has a different water holding capacity, a different rate at which it will absorb water, and a different stage at which water is available to plants. Heavy, clay soils, for example, take in water slowly and hold onto it tenaciously. Plants reach their wilting point—the point at which there is no more soil moisture available to them—while the clay soil still contains 35 per cent moisture. Light, sandy soil, on the other hand, takes in moisture freely and gives it up easily. Sandy soil will hold but 20 per cent moisture when plants reach the wilting point.

The object of irrigation is to keep the soil moisture somewhere between the wilting point and the saturation point. To accomplish this requires a nice judgment of the soil moisture and the amount of water to apply. Electrical moisture testing devices such as the one designed by John Bouyoucos, Professor at the Michigan Agricultural Experiment Station,

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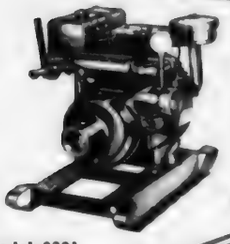
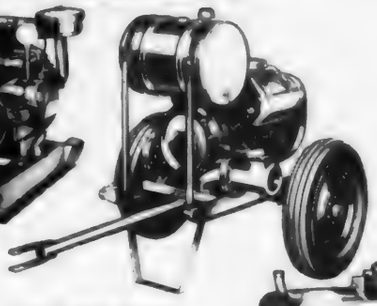
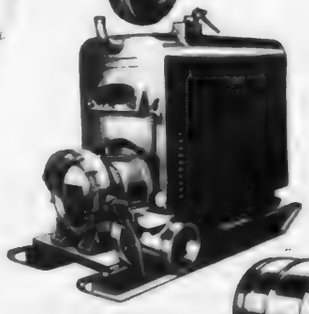


Model 620I
2½" Pump



Model 54A-VG4D
4" Pump



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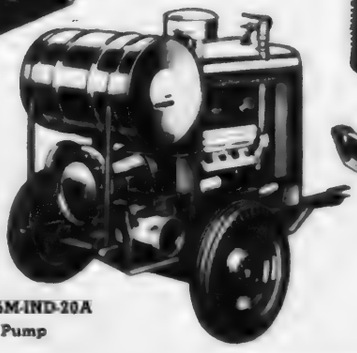
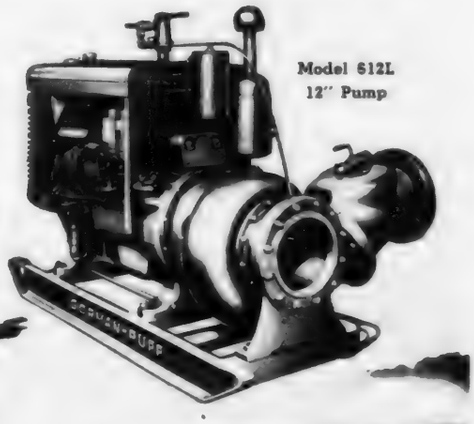


Model 55M-IND-20A
8" Pump



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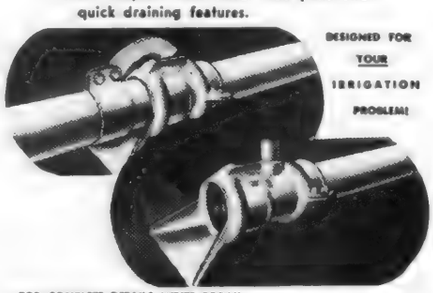

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Lansing, Michigan, can be used to give an accurate soil-moisture reading. An experienced farmer, however, will be able to make a fairly accurate judgment by the look and feel of the soil.

A rough test suggested by C. H. Diebold, of the Soil Conservation Service, is to spade up a bit of earth from 12 to 14 inches below the surface and try to squeeze it into a ball—squeezing it about as hard as you would on a hard-milking cow. If the soil won't form a ball after three or four squeezes, it has less than a fourth as much readily available moisture as it would have at field capacity and should be irrigated. If a ball is formed, the soil has at least one-fourth capacity. Now toss the ball about a foot into the air and catch it. If it breaks and crumbles after five such tosses, the soil contains from one-fourth to one-half the readily available moisture it will have at field capacity—this is the best time to irrigate. If the ball holds firmly together after five tosses, there is more than one-half readily available moisture and you won't have to irrigate for a while.

The danger signs that too much water is being put on the land are puddling and run-off.

Tied in with irrigation is the problem of drainage. One agronomist has said, "If a field doesn't have good drainage you shouldn't irrigate. I knew a potato raiser who was irrigating a crop on poorly drained land—too poor for potatoes in the first place. A couple of days after he had given the field a good slug of water he got a nice rain and lost the whole crop. If drainage is a problem on the land, I'd say that the farmer should solve this problem first before he starts thinking of irrigation."

Another point that most old hands at irrigation bring up is the matter of increasing the fertilizer application. On most farms water has limited the amount of a crop that can be grown and the farmer has applied the amount of fertilizer the thirsty crop could use. Removing this water limitation, he will have to think in terms of increasing his fertilizer application by about 50 to 100 per cent. Some of this fertilizer can be applied through the irrigation system itself, using one of the new liquid fertilizers developed for this purpose. The plant foods are measured exactly for the area covered by the laterals and fed into the system through a special intake attachment at the water supply. Fertilizer is usually put through the pipes

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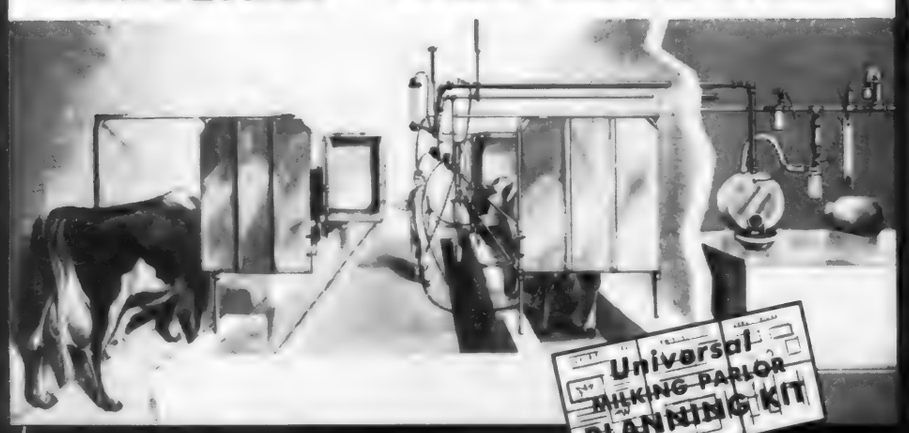

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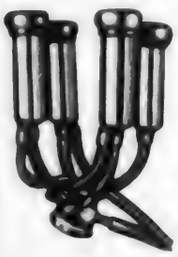

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at the beginning of a setting so that the water will have a chance to wash the corrosive solution from the pump, pipes and sprinklers before shutting down for a move.

Costs

Since each system must be tailored to fit the farm it serves, the cost of equipment varies rather widely, running from $45 to $200 an acre. At first glance this may seem like a confusing spread, but let's look at the problem as one New York dairyman faced it. He had one 20 acre rectangular field 1320 feet long by 660 feet wide with a good stream running down the long side, an ideal set-up for irrigating a pasture to use in mid-summer to take the place of the silage he had been feeding when his pastures dried up. The stream, in effect, was his main line

IF IRRIGATION water comes from a lake or pond the pump installation can be permanent.

and all he needed was a pumping unit, a short, 60 foot section of main line to reach the field, and one 660 foot lateral with 11 sprinklers on it. Each sprinkler covered a strip of land 60 feet wide and poured on 2 inches of water in 5 hours. When one setting had been watered he moved pump and line 60 feet down the stream and continued watering. He could do the whole job with a 165 gallon per minute capacity pump and a 12 horsepower engine-pump unit which cost in the neighborhood of $550. His pipe, sprinklers, and fittings cost $1257.

This same farmer also figured his irrigation costs for a 20 acre back field that lay some 400 yards from the stream and at a 100 foot higher elevation. His first item of added cost was for 1840 feet of main line. To push the water up to this field he had to use a 36 horsepower pumping unit which cost $850 and his pipe bill would have been $3388.00. "I

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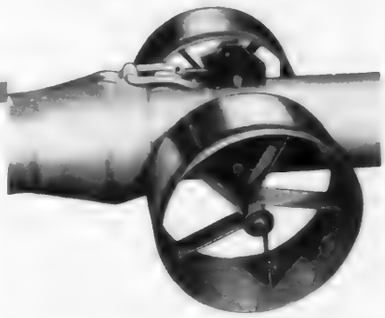

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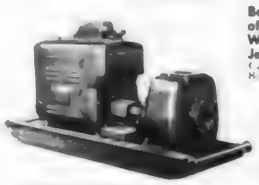

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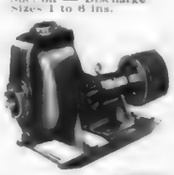

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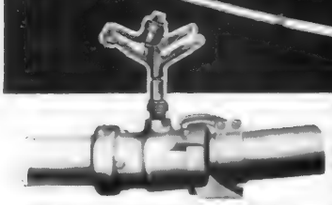

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figure that I could even irrigate oats profitably on the lower field," he said, "but if I were to put in a system to water the back patch only a real high return truck crop would make it worth while."

Tom Pottenger, mentioned earlier, was able to hit close to the lowest per acre price when he bought his system. He had two big points in his favor. In the first place he has the river at one end of the farm and a shallow, high producing well at the other, which cuts down on the length of main line he needs to reach any part of the area. His second big advantage is that in raising sweet corn for the market he starts planting as early in April as the weather permits and continues planting at weekly intervals until July. With such a system he has part of his crop harvested before the last planting has sent up its first leaves. So only about 40 acres of the crop is making peak demands on his irrigation system at any one time.

Late last fall, after living through a drought which cut his corn yield by 40 per cent, Pottenger called in an agronomist and an irrigation engineer from Ohio State University to advise him on the possibilities of irrigating the farm. They found that the sandy, well drained soil and abundant water supply made the place practically ideal for supplemental irrigation. He next drilled a test well at the proposed site of the irrigation well and found plenty of water in the thick gravel beds which lie from 15 to 50 feet below his land. By this time he was ready to talk business, and invited several distributers of irrigation equipment to send their engineers to the farm, plan the operation, and make a bid on the job.

With each engineer he went over the whole problem from water supply to the time and man-power it takes to move a lateral (in his case they all agreed it would take two high-school boys about 45 minutes to move a 1400-foot lateral to a new setting). He compared their equipment and asked them every question that a careful farmer could dream up.

In the end, he wound up with an intensive course in irrigation engineering from some of the top men in the field and an order for a system which consisted of a mobile pump powered by a 50 horsepower industrial gasoline engine which can handily turn out the 500 gallons a minute needed; 1060 feet of six inch main line; 480 feet of five inch line which can be used at one point to extend the main line and at another to lengthen the laterals; 1380 feet of four inch lateral line; and 24 sprinkler heads along with the reducers, adapters, tees, plugs, elbows, nipples, and other hardware needed to complete the system. He also wound up with a bill for $5,950.

"In normal years," Pottenger said, "We'll put an inch and a half of water

on the corn twice, at silking and tasseling time. If we run into a dry spell like last year we'll water every eight days after any one inch rain. The sprinklers will be set at sixty foot intervals along the line and we'll move the line eighty feet down the main for each setting. Each setting will water a little over an acre and a half, so, with three moves a day, we should be able to put water on five acres a day without having to go into night irrigation."

Returns

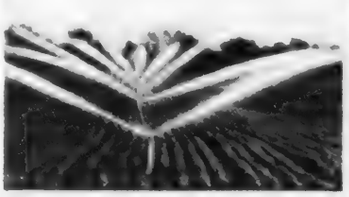
"We expect that in normal years the irrigation system will pay for itself in three or four seasons," Pottenger continued. "In the first place we believe we will be able to average twelve to fourteen hundred dozen ears to the acre with irrigation where, without it, we have been shooting for a thousand dozen, like field corn men shoot at a hundred bushels to the acre. Then we should be able to get on the market a week earlier, which means a lot when you realize that corn is selling for about twice as much then as it is later in the season. And finally, we plan to follow the corn with summer and fall planted alfalfa and give it enough water so that we'll be able to take five or six tons an acre off it the next year. Of course we may not get the forty dollars a ton they were paying for hay out our way last winter, but there's always been a pretty good market for it and we may increase the number of feeder lambs we handle and feed it out ourselves."

Pottenger's hope to increase his corn yield by 20 to 30 per cent seems well within the realm of possibility when compared to the actual increase due to irrigation made on the J. Alvin Hardin farm near Knightstown, Indiana. Hardin, who is a banker, works closely with his tenant, John Lansinger, in keeping careful records on his irrigation project. In 1952, which was a dry year in that area, he made 127 to 137 bushels to the acre on 16 acres of irrigated field corn as compared to 42 bushels on unirrigated land. To make this yield he put on 5.8 inches of water and burned up 375 gallons of gasoline to operate the pump.

"This last year," Hardin said, "we increased our irrigated acreage to twenty-two acres of corn and eight acres of pasture. We put on around two inches of water at tasseling time, two and a half inches two weeks later, and another two inches during the August dry spell. We were also trying out a number of different hybrids and found that our yields ranged from a hundred and sixty-six bushels to the acre down to a hundred and thirty-four. This was a pretty good corn year around here. Our non-irrigated corn ran a hundred and two bushels. The point I want to make is that even during good

GET PORTABLE SPRINKLER IRRIGATION NOW...

FOR PLANNED PRODUCTION ALL YEAR



This sign identifies dealers who sell Reynolds Aluminum Irrigation Pipe.

This label identifies Reynolds Aluminum Irrigation Pipe.

While winter's still here, find out all the advantages of planned production with portable sprinkler irrigation on your farm. Come Spring, come Summer, be prepared for all kinds of weather with "push button rain." Your portable sprinkler irrigation system will bring you earlier crops . . . increased yields . . . crops that *grade* higher, too. Even if there is "normal" rainfall. And if a drought should come, planned production with your portable sprinkler irrigation system will make the difference between a loss or a profit.

Don't delay until rainless days come and everyone else wants irrigation pipe, too. There may not be enough to go around. Order now while supplies are available.

Remember—strong, lightweight, rustproof Reynolds Aluminum Irrigation Pipe is the lifeline of your portable sprinkler irrigation system. It's light . . . you can move it alone. It's durable . . . you can maintain it alone.

Consult your local, experienced irrigation equipment dealer who handles Reynolds Aluminum Irrigation Pipe. He will plan a portable sprinkler irrigation system that is best for your needs. It's the best "crop insurance" your money can buy.

Member of the SPRINKLER IRRIGATION ASSOCIATION

REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY, 2578 S. Third St., Louisville 1, Ky.

Please send "More Income Per Acre", your new illustrated booklet on the applications and advantages of portable sprinkler irrigation.

Name.....

R.F.D. or Street.....

Town.....State.....

SPRINKLER IRRIGATION UPS TOBACCO YIELD 500 POUNDS PER ACRE

Better quality leaf brings him higher prices, too —says grower

Lancaster, Pa.—Striking proof of the benefits of lightweight, portable irrigation systems is shown in the picture at right. Displaying the significant difference between tobacco grown on irrigated and nonirrigated acreage is grower Rudy R. Landis of Lititz Pike. Mr. Landis raised his crop on nearby Buckwalter Farm.

As Landis explains it, sprinkler irrigation through Alcoa Aluminum Pipe was used on a six-acre planting of cigar tobacco. Adjoining acreage was also planted to tobacco but was given no supplementary irrigation, thus allowing an accurate comparison.

"We not only got a substantial increase in yield from the irrigated acreage, but also in quality", Landis states. "The irrigated leaf was longer, had better body to the shank and matured earlier, giving us the benefit of extra curing time. Our actual yield was about 500 pounds more per acre on the irrigated land, and the tobacco itself brought ten cents more per pound."

Whatever your crop is,
Wherever your State,
To add to your profit,
Just irrigate.

Sprinkler irrigated tobacco at left brought ten cents more per pound than nonirrigated leaf at right.

Tempered Aluminum Alloy Fits Alcoa Pipe for Rough Service

Backbone for the most reliable sprinkler system is Alcoa Aluminum Pipe. The development of exhaustive tests, it is made from a superior, heat-treated alloy that withstands rough and continued usage. It needs no painting. Only one third the weight of comparable steel pipe, it has a smooth inner surface that assures free-flowing performance at minimum pumping pressures. Available through leading systems dealers. Alcoa Aluminum Irrigation Pipe comes in diameters to suit individual system requirements. To identify pipe made to these rigid specifications, look for the blue and yellow Alcoa label on the pipe you buy.

Member of
SPRINKLER IRRIGATION ASSOCIATION

ALCOA ALUMINUM

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ALUMINUM COMPANY OF AMERICA

2137-C ALCOA BUILDING, PITTSBURGH 19, PENNSYLVANIA
Please send me a free copy of *Pipelines to Profit.*

Name_____

Address_____

City_____ State_____

years irrigation paid us at the rate of about fifty bushels to the acre.

"We also irrigated eight acres of alfalfa, giving it two inches of water after the first cutting and two and a half inches a couple of weeks later. We got four cuttings instead of the three on the unirrigated alfalfa with an increased yield of seventy-four per cent after the first cutting.

"In figuring our costs we find that we pumped about six and a half inches of water on each acre for a total of over five million gallons. The cost of labor, gasoline and depreciation—I depreciate equipment at the rate of ten per cent a year: that way I get some of it back in taxes—ran right around $30 an acre or around $4.60 for each inch of water. When you compare the results we've had in a good year with what we've had in the bad years, all I can say is that as a banker I don't know of a better way to get that much return on your investment."

PLAN NOW for LARGER YIELDS per acre with less work and water

NEXT SUMMER you can have plenty of water where and when you need it with an AMES ROTO-RAIN revolving sprinkler system. Your laterals are moved in a matter of minutes, because the Ames ABC Couplers are locked and sealed by water pressure. No hooks or latches . . . easiest handling pipe ever developed.

Your Ames dealer has portable equipment for all watering methods: sprinkle, furrow and flood. Without cost he will engineer a low cost Ames system to meet your needs. See him NOW, or mail this handy coupon . . .

AMES **PORTABLE IRRIGATION EQUIPMENT**

Just mail this coupon with your name and address to nearest Ames Plant for helpful free folders on:

- ☐ Roto-Rain Revolving Sprinkler Systems
- ☐ Perf-O-Rain Low Pressure Sprinkler Pipe
- ☐ Gated Pipe for Controlled Furrow Watering
- ☐ Lo-Head Surface Pipe for Flooding
- ☐ Tow-A-Line and Wheel-O-Rain

W.R. AMES CO.
Established 1910 AG
150 Hooper St., San Francisco 7, Calif.
3905 East Broadway, Tampa 5, Florida

IS NOW THE TIME TO START IN SHEEP

(*Continued from page* 70)

called mutton breeds, around 75 per cent of the income is from meat. This type is typical on farms of the central states. Sheep breeding associations not withstanding, the decline in sheep numbers is clearly among the wool breeds.

Wool sold in 1953 at about 53 cents a pound, just 11 cents above the 1942 price. But wheat sold at almost double its 1942 price; corn went up two-thirds; cotton doubled. The sheepmen have been in a squeeze between mounting production costs and reduced income.

The government stockpiled foreign wools before and during the war. Tariff on imported wool was down, causing lowered competitive prices for domestic wool. Ceiling prices on our wool were set relatively low compared to those set on other livestock products. Disposal of stockpiles in 1948 permitted some price improvement, but controls came back along with the Korean conflict, and the tariff question remained. The sudden withdrawal of government wool buying in 1951 caused the wool market to hit bottom. Sheepmen have felt discriminated against through it all, and many of them have given up.

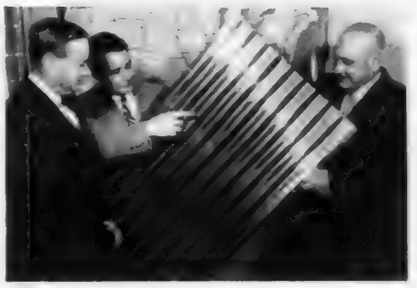
What Are the Favorable Factors Now?

1. The U. S. uses more wool than any other country in the world and our needs are increasing along with our population. The 1953 wool clip totaled about 229 million pounds of shorn wool, which is one-fifth under the 1942-52 average and is far below the goal advocated in the interest of national defense. Although wool is a strategic commodity, we produce only one-fourth to one-third of our needs, or less than half enough to take care of military requirements alone, based on World War II usage. Imported wool must be brought here under possible ocean attack. Synthetic fibers have made no great inroads against wool for military needs and in all traditionally wool fabrics, pure wool is still preferable, in the opinion of many who feel that only wool can offer the warmth, durability and moisture absorption needed in military clothing. Some research investigators believe that synthetics have not met all claims made by manufacturers. There will always be a place for wool, they say.

2. Legislation now before Congress will be of advantage to the sheepmen. The government is being urged to improve lamb and wool marketing and grading. Sheepmen want tariffs on wool that will reflect the higher cost of production in the United States as compared to other countries. Some feel that quotas should govern wool imports; others are pressing for direct government subsidies taken from tariff revenues and paid to domestic growers for

Making good products better

New Alcoa® Farm Roofing Sheet is stronger, more corrosion resistant; retains same high heat reflectivity.



Aluminum technical and sales experts show great interest in new Alcoa Farm Roofing Alloy.

Pittsburgh, Pa.—Aluminum Company of America (Alcoa) reports the development of a new aluminum alloy for farm roofs.

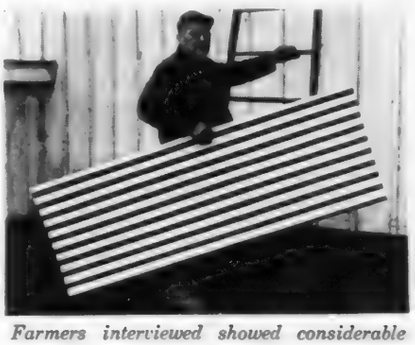
After years of research and testing, this new sheet is now ready for farm use.

NOW AVAILABLE. Alcoa's distributors and dealers are now stocked with this superior aluminum roofing material. Announcement of the development of this new material was held back until it was immediately available to farmers.

Aluminum Research Laboratories have 29 years of testing corrosion resistance of aluminum alloys.

CORROSION RESISTANCE GREATLY IMPROVED. Practical exposure tests in all parts of the United States indicate the new alloy is the most successful ever recommended by Alcoa for farm use.

STRENGTH INCREASED. Alcoa technicians report that the new sheet has improved holding power. This means that roofs of the new alloy sheet will have even greater resistance to damage by high winds and hail. As in the past, proper application is stressed for greatest satisfaction.



Farmers interviewed showed considerable curiosity about the possibilities of the new alloy. Warren W. Scott of Imperial, Pennsylvania, decided to test the sheet for himself.

HEAT REFLECTIVITY RETAINED. Farmers will get the same high heat-insulating value that assures animal comfort and productivity with the new Alcoa Alloy. Laboratory tests show that while strength and corrosion resistance have been raised, heat reflectivity is the same.

EASE OF APPLICATION. Sheets of the new Alcoa Alloy have the same great advantage of light weight. It will still be possible to put on an Alcoa Aluminum Roof in record time.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

Aluminum Company of America
2114-C Alcoa Building, Pittsburgh 19, Pa.

Please send me (free of charge—without obligation) the Alcoa "Farm Roofing Manual".

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Address_____

City_____ State_____

TUXEDO SOLVES STICKY PROBLEM!

Long research and unusual persistence on the part of the Early & Daniel Company, makers of Tuxedo feeds, have combined to solve a problem that has bothered feeders ever since the value of molasses as a feeding supplement for dairy cows, beef cattle and sheep was established.
The problem, briefly, was how to handle the sticky stuff.
Molasses feeds were hard to transport, difficult to store, tough to handle and mix with other feeds, and tended to spoil easily.

TUX-SWEET ROLLS the Answer

Tux-Sweet Rolls, Early & Daniel's answer to the molasses problem, contain 45% molasses, 11% protein, and valuable vitamins and minerals.
Tux-Sweet Rolls are non-sticky. They are "free flowing"; easy to handle; they grind easily and they won't set up.

Convert Roughage into Profitable Milk, Beef, Mutton

Spread over roughage or silage, or mixed with grain feed, Tux-Sweet Rolls promote the activity of bacteria in the rumen of cattle and sheep, with the result the animals are better able to turn a higher percentage of cheap roughages into profitable pounds of milk, beef, and mutton.
Tux-Sweet Rolls are packed in 50-lb. bags because only small quantities are required for good results: 1 to 2 lbs. per head per day.

Tuxedo "Pro-Molas" Rolls

For the feeder who desires a higher protein content in his molasses feed supplement, Tuxedo developed "Pro-Molas" Rolls, similar to Tux-Sweet Rolls except they contain 35% molasses combined with 24% protein, plus vitamins and minerals.
Both the "Pro-Molas" rolls and the Tux-Sweet Rolls have been well received by feeders eager to gain the advantages of a molasses supplement from a molasses feed that for the first time in history is non-sticky and easy to handle. Tuxedo Feeds Dealers report big sales on their new non-sticky Tuxedo molasses feeds.

THE FEEDERS' SILENT PARTNER

THE EARLY & DANIEL COMPANY
Cincinnati 2, Ohio

Our 73rd Year

the difference in production costs between here and abroad.

Congressmen know that the economy of our western states will suffer without sheep, and with wool having been declared essential by the administration, tariff changes are expected.

3. Lamb will probably have less competition from other meats in the months ahead. The trend has been down in hog production. Fewer hogs should work for better lamb prices. Beef production seems to have reached its peak. Increased cattle feeding, along with cattle liquidation in dry areas last year, added up to lower beef prices in 1953. This means smaller breeding herds ahead, and an eventual up-swing in beef prices, with less competition given lamb.

Last year's drought also caused uneven bunching of lamb marketing and prices declined not only because of numbers, but because many of the lambs were of unfinished low grades, which depressed all lamb values, since lambs are sold on averages.

4. People will eat more lamb if it is available at a price consistent with other meats. The 73 pounds of beef per person consumed in 1953 is just short of our record high, but pork dropped back from 72 pounds in 1952 to 62 pounds in 1953. Chicken was eaten at the rate of 29 pounds per individual in 1953. The consumption of lamb amounted to about 4.2 pounds, although almost twice that amount was consumed in three out of the past forty years. While available lamb and mutton have dropped sharply, our population grows by two million yearly.

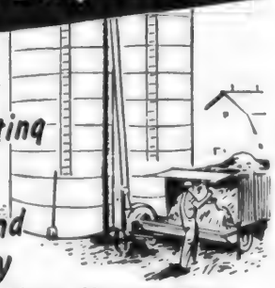
New methods of retailing, particularly pre-wrapped self-service merchandising, are acquainting housewives with lamb in areas where it was previously little known. Many people have never tasted lamb because it has never been brought to their attention through organization or advertising. Sheep, which use very little processed grain or other purchased feed items, have never been promoted by interests such as the feed industry, which advertised the Chicken of Tomorrow. Soldiers who saw duty in the Eastern War Theatre developed a distaste for lamb because they were fed inferior quality or poorly prepared lamb. Segments of the sheep industry are now behind efforts to improve the grade of lamb now being served the armed forces as the first step in enlightening the public.

5. Wool processing techniques have not changed essentially in a thousand years, but government approval is at last being given to research which should result in scientific methods that might well expand the uses for wool while lowering its processing costs.

6. It will take perhaps ten years, under the most favorable conditions, for us to rebuild our sheep population to the totals recommended to provide the amount of lamb we can use, the 360 million pounds of wool we need for national defense, and

Attention Dairy Farmers!

Speed Forage Harvesting • Save Time and Money



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FORAGE BLOWER

Strong • Rugged • Fast
Handles BIG Tonnages
without Breakdowns or Plugging

Handle up to a ton a minute of grass or corn silage with the New Heavy Duty HAYCLONE—the fastest, most rugged blower on the market today. Unsurpassed for handling long cut, wilted chopped hay.

You can put your forage away as fast as the wagons can bring it in. No delays. No tie-ups. New type slat conveyor provides desirable under-cutting action eliminating chain breakage. The high capacity "L" shaped blades on the heavy blower wheel prevent any build-up of silage in the housing, assuring smooth, powerful, non-plugging operation.

EASY TO LOCATE—EASY TO MOVE.
Write for Full Details Today!

THE C. O. BARTLETT & SNOW CO.
6360 Harvard Avenue • Cleveland 5, Ohio

DO YOU HAVE A CHOICE?

Or Are You Growing One-Way Calves?

American Brahman Crossbreds are Two-Way Cattle. They wean in milk-fat slaughter flesh. This gives you a Two-Way choice on the market.

If the slaughter calf market is up you can cash in for the bonus. If feeder demand is strong you have weight and thriftiness to offer.

In either case you will go to market with a 50 lb.-per-calf heavier load with American Brahman crossbreds.

For detailed performance reports **FREE** Write Dept. C

ABBA AMERICAN BRAHMAN BREEDERS ASSOCIATION
1208 LOUISIANA • HOUSTON 2, TEXAS

the number of sheep to make best use of our grass resources.

Where Do We Go From Here?

The answer depends on where you start. Caution is still the watchword in the large sheep enterprises of the rangeland because of the high labor costs at lambing and shearing time, the scarcity of skilled labor and the difficulty of reducing costs through mechanization. The main purpose of the sheep industry is to provide a market for pasture. The better the pasture, the better the product. So, where a farmer is his own operator, has ample family labor, especially at lambing time, and has understocked pasture, or land capable of improvement for grazing, he has a good chance of making money with sheep.

Henry Besuden, commercial sheepman of Winchester, Kentucky, who won his seventh grand championship in the lamb carload showing at the International last December, thinks sheep are as good an investment on high priced land as they are on the western ranges. "Lamb," he says, "especially in the East, is eaten by people who are not too much affected by economic conditions, and wool is worn by everybody. If you don't mind sitting up nights with the ewe flock at lambing time, and you have fair forage and ewes that will produce twins, you are in good shape in the sheep business. You can have all the cattle your farm will carry, and still maintain a small flock of sheep."

The purebred breeder is in a good position, too, according to Ruth Day of Columbia, Missouri. In her opinion, "It won't be long before agricultural experts will be scratching their heads trying to figure out a way to feed all of us. Hogs and chickens will eventually compete for food eaten by man, and cattle require grain for quality meat. But not so with sheep. Until man has to eat grass without its first being converted into lamb chops, the future of sheep is secure."

The statement is frequently heard that sheep return more per dollar invested than any other kind of livestock and are the only animals that make a prime product on pasture alone. In many areas, sheep are necessary to balance a production program, for they can utilize low quality forage not suited to other farm stock and can frequently turn marginal or rugged land of little crop use into profit. Hilly ground which is not readily cultivated is at the same time less likely to be infested with sheep parasites and diseases. Sheep often combine nicely with beef cattle, or with special types for pasturing small grains or other winter cover crops, to which tobacco fields are usually sown. Tobacco barns can be used for lambing when the tobacco crop is sold. In any case, sheep need only very simple housing and little equipment. But they do need good fencing.

Control of sheep diseases and parasites has made great strides in recent years. The

Protect your Property!

LAW and the FARMER

By J. H. BEUSCHER, Prof. of Farm Law, Univ. of Wisc.

Here's the complete one-volume law book every farmer can understand and put to use. Everything you need to steer clear of costly legal troubles . . . and gain all benefits due you under State and Federal laws. Latest practical guidance on Partnerships, Family Corporations, Wills, Tax Savings, Leases, Mortgages, Water Rights, Fencing, Trespass, Rural Zoning, and much more. 416 pages, illustrated; many handy farm, business and legal forms. Only $4.95.

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By 314 Specialists — Edited by RUDOLPH SEIDEN

Everything you need to know about maintaining and improving health and value of your Cattle, Sheep, Goats, Swine, Horses, Mules. How to use latest Drugs, Antibiotics, Vitamins, Disinfectants and Insecticides for best, most economical results. Prevention and treatment of every Disease, Parasite and Common Injury. 624 big double-column pages. Over 300 illustrations. Only $7.50.

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Hay one swath from mower is processed and "fluffed" to speed natural aeration and curing. Retains leaves, protein and carotene (Vitamin A). Hay remains soft and pliable. Beats weather hazards — Put up hay the same day — Gains 24 hours over pre-Meyer method. Saves time . . . labor . . . and food value — makes your hay worth more.

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THE MEYER MFG. CO.
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MAIL COUPON FOR FREE FOLDER!

Tells how to convert wood waste into valuable WOOD CHIPS with a FITCHBURG CHIPPER

Maple Brush, Straight Blades, set 1/8".

Green and Dry Slabs (Pine), Serrated Blades, set 3/32".

Pine Board Butts, Serrated Blades, set 1/16".

You can thin out your woodlots, give new life to young trees, and convert waste wood into valuable wood chips which have many uses on the farm. Wood chips provide a worthy substitute for more expensive materials used for mulch, poultry litter, and stable bedding.

Learn how you can produce low-cost wood chips from waste wood on your farm. Send for the new, illustrated Fitchburg Chipper Folder. You will find quotations from USDA publications, ways to earn extra money with a Fitchburg Chipper, technical data on the Chipper, diagrams, specifications, types and models available, etc.

Send the handy coupon below for your FREE copy!

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Please send me the new Fitchburg Chipper Folder.

I am interested in Wood Chips for:

Please Check
☐ Soil enrichment ☐ Garden or berry mulch
☐ Stable bedding ☐ Fruit tree mulch
☐ Poultry litter ☐ Farm roads, field lanes

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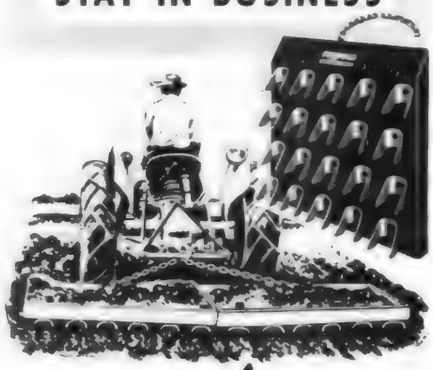
Town_____ State_____

FOR THE FARMER
WHO INTENDS TO
STAY IN BUSINESS



Soil Surgeon
"CORSON OF COURSE"

. . . after plowing, does the combined work of disc, harrow, packer, leveler Better!

Farmers everywhere report savings in time and labor as well as increased yields from properly prepared seedbeds. The way the Soil Surgeon is made marks another forward step in the trend to more productive farming. Today's farm competition demands it. Less capital is involved in buying Soil Surgeon — through increased yield more money is earned in using it. It's a good implement for the farmer to have who intends to "stay in business".

HERE IS THE SECRET OF SOIL SURGEON

1. SWIVEL ACTION AGITATES SOIL
2. EDGES SLICE AND CUT OUT AIR POCKETS
3. OUTWARD THRUST OF BLADE PITCH" GRINDS AND PULVERIZES
4. DOWNWARD THRUST CRUSHES AND KEEPS TRASH DOWN—MOISTURE IN

Prepares seed beds better because it does not turn up trash, dormant weed seeds or vegetation. Works plowed ground down—never up, works in all types of soil. Bevel pan front fills tracks and holes and helps level. Easy to operate, long trouble free service. Excellent for renovating pastures. Low original cost, practically no maintenance.

Ask your dealer for a demonstration or write us direct because we guarantee this implement to do everything we say it will or money refunded

FASTER FARMING
CORSON
BROTHERS INC.

2165 N. SHERMAN DRIVE • INDIANAPOLIS 18, IND.

dog problem is still with us in many areas, but practical remedies such as running goats or cattle with the sheep prove effective. Dog insurance is available at low rates in some places.

Professor L. A. Kauffman, in charge of sheep husbandry at Ohio State University, says: "Any time you can buy a yearling ewe for the price of a lamb or less, you have made a good investment. Right now both are about $20.00. It has been proved time and time again that a farmer can buy breeding ewes in the fall, winter them for about what the wool will bring the following year, and sell the first lambs for as much as the ewes cost. That leaves you with your ewes paid for out of your first crop. No bank will return you that kind of profit on your investment."

Surveys show that we have forage for a fourth to a third more sheep. Most of that land is in the eastern states. Most of the feed and family labor is there as well. We cannot look for any great change for the better on the western ranges within the near future. But the general farmer has a very bright outlook in sheep. With the range flocks decreasing, farm flocks will go more to purebred animals as the supply of western ewes dries up. The farmer will be called upon to supply not only an increased demand for meat and wool, but replacements as well.

RICE

(*Continued from page* 75)

Another expense about which the old-timer had no worry is the drying charge. In the days when the crop was cut and threshed out of the field it was dry enough to store with comparative safety when it came from the threshing machine. The use of the combine, however, necessitates the use of artificial drying, which costs the farmer about 12½ cents a bushel. This service is provided in some instances by private operators, more frequently by farmer-owned cooperatives.

Fertilizers

Fertilizer application is nothing new in rice culture, but it has become more of an exact science in the last decade or so. The anhydrous tank is a common sight on many farms where the high pressure gas has become one of the accepted nitrogen carriers. Most growers prefer to apply the elements separately; relatively few use mixed fertilizers.

Nelson Spicer, a veteran rice farmer, has found the right combination of nitrogen and potash for big crops on his land. "Before we started using potash one sack of ammonium nitrate to the acre, 33 pounds of nitrogen was all we could use without causing serious lodging," he says. "It seemed the straw was too weak to use the addi-

AN ALL 'ROUND PUMP for the FARM

The MIDGET 1½" Lightweight

For farm uses too numerous to list! Pumps 400 times its weight of water per hour at average heads. Primes in 75 sec. at 25 ft. suct. lift. Has maximum lift of 30 ft. (Sea level). Weighs only 62 lbs.

GORMAN-RUPP LIGHTWEIGHTS COME IN 4 SIZES:

The Midget 1½"	— wgt. 62 lbs.	—	5,500 G.P.H.
The Pelican 2"	— wgt. 70 lbs.	—	7,500 G.P.H.
The Hawk 2"	— wgt. 110 lbs.	—	10,000 G.P.H.
The Eagle 3"	— wgt. 117 lbs.	—	18,000 G.P.H.

Send for Bulletin 7-LW-13

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Power Seed and Fertilizer Distributors

ECONOMICAL and DEPENDABLE, pay for themselves with fast, easy broadcasting of grass seed (including brome), grain and fertilizer. P.T.O. or motor driven. 1 to 5 bushels capacity. Send for free *literature* and *informative grass land booklet.*

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HOW TO KEEP BEES

Pollination is very important to the successful growing of legume, fruit, and vegetable crops; and Honey Bees are by far the most dependable instruments of pollination.
Let us send to you at no charge, booklets on beekeeping. Extension Bulletin #253 which tells of experiments with Honey Bees and clovers, and your 1954 catalog of Root Quality Bee Supplies — Everything you need to start this spring in time for the early fruit blooms and the clovers that follow.

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DEPT. 30 — MEDINA, OHIO

SUNBEAM CHICKS

"BEST UNDER THE SUN"
U.S. Approved-Pullorum Clean
Free Illustrated Catalog
SUNBEAM HATCHERY
Box 40 Findlay, Ohio

"We sure are in demand"

A flock of Hampshire Sheep is the ideal diversified live stock program for the cattle, hog and poultry breeder.
For Breeders List
AMERICAN HAMPSHIRE SHEEP ASSOC.
72-Q Woodland Ave. Detroit, Mich.

tional nitrogen. But since we have been applying 100 pounds of 50 or 60 per cent potash we have produced straw stiff enough to make use of 60 to 80 pounds of nitrogen to the acre.

"The muriate of potash also seems to counteract an alkaline condition of the soil that is presumably caused by the water from our wells.

"The use of anhydrous is spreading rapidly down here. We like it and we use considerable of it. However, our experience is that it does not seem to last the crop clear through to maturity. We get best results by applying 50 or 60 pounds of anhydrous just before seeding, if we are going to seed in water. Then we apply 100 pounds of ammonium sulphate or its equivalent just about the time the rice heads.

"Some growers apply phosphate and nitrogen in the form of 16-20-0 when drilling," Spicer continues, "but our experience has been that with this method we get an excessive growth of early grass, especially if we have a rain soon after seeding. So, our method of applying super-phosphate is to put it on the crop of oats or lespedeza that just precedes the rice crop. If the preceding crop didn't have phosphate and the rice shows a need for it we apply about 50 pounds of 45 per cent phosphate by aeroplane after the first watering."

Milling and Marketing

Cooperatives are the big guns in the milling and marketing of rice. Some of the big co-ops like the Arkansas Rice Growers Cooperative Association do not buy the rice from the grower but dry, mill, package, and sell it for him as a finished product under the Association's brand name. When a grower delivers his crop to the Association he receives an advance of 75 per cent of its estimated value. The final price depends upon the variety of the rice, its grade, and milling yield. For example, last fall the price for Bluebonnet rice was $2.24, Zenith, $2.08, and Jap, $1.94. Jap rice is a very short grain rice, the bulk of which moves into export trade. Bluebonnet is a long grain variety and Zenith a medium grain, both of which are more popular with the American housewife. The prices quoted are for No. 3 grade rice, the grades being determined by the amount of contamination in the sample based on color and appearance, damage by heat or other causes, or the presence of red rice, chalky kernels, or of such foreign matter as indigo, coffee bean, or morning glory seeds. Rice that grades No. 1 and No. 2 command a premium and all below No. 3 sells at discounts.

When "rough" rice, as it is called, is milled, the hull, bran, and polish are removed and the resulting product is called "clean," or white rice. Milling yield refers to the amount of clean rice obtained from a barrel (162 lbs.) of rough rice and the amount of head rice, or unbroken kernels.

SEAMAN SELF-PROPELLED TILLER

Often Cuts Tillage Costs 20% to 40% or More!

Seaman Self-Propelled Tiller. 7 foot tillage width, gasoline or diesel powered.

The Seaman Self-Propelled TILLER milling and mixing-in standing corn.

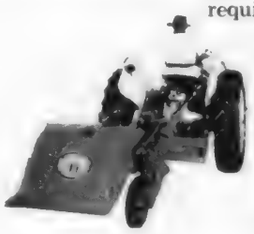
An analysis of operating costs for the SEAMAN Self-Propelled Rotary Tiller (checked carefully with many owners) shows that savings as high as forty percent are often realized — in comparison with the accepted average costs of conventional tillage.

This analysis is yours for the asking.

There is no mystery about the economy of SEAMAN-tillage. Generally, the TILLER prepares a seedbed in one operation, usually at 2 to 3 miles per hour, but frequently at 3 to 4 miles an hour. Compare this simple, quick, low-cost operation with the costs of multiple tractor trips required in conventional tillage.

Write for a copy of the analysis of operating costs and we'll also send you the booklet "Benefits of Rotary Tillage." It covers over 22 years' experience with rotary tillage and you'll find it informative and interesting.

Just drop us a postcard.



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The Seaman 36 Inch Tillit speeds seedbed preparation, pasture renovation, mulching. Attached to most 2 or 3 plow tractors the Tillit adjusts easily to medium, fine, or coarse tillage — Wider use of the Seaman tillage method is creating a big demand for additional dealers. If there is no Seaman dealer in your locality write for particulars if your are interested.

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Guaranteed to call cattle for feeding, shipping, dehorning. Bellows like a bull. Cattle respond quickly. Great time-saver! Easily installed.

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Thus a good milling yield on long grain rice might be 75 pounds of head rice out of 110 pounds of clean rice per barrel. Besides the head rice the milling will produce second heads (less than three-fourths perfect) screenings and brewers rice. Since the head rice demands the highest price in the trade, milling yield is a very important item.

THIS RICE is approaching maturity. The levees are hidden by the growing crop.

In estimating the amount to be advanced to a grower all these factors are taken into consideration. Final settlement is made after the entire crop handled by the Association is disposed of.

Diseases and Pests

The rice grower is plagued by such maladies as *straight head,* which causes a sterile floret and blank heads; *white tip,* distinguished by bleached areas that occur at the tips of the leaves and cause a reduction in yields: *brown spot; stem rot;* and *blast* or *rotten neck,* which produces broken-over heads.

The most common pests are the rice water weevil and the stink bug. This year the army worms joined the Navy and for the first time in the memory of the oldest growers on the Prairie, sailed across the fields to attack the young rice. Toxaphene is the generally accepted defense against these insects.

To control weeds—mud plantain, coffee bean, indigo—2,4-D has proven very successful, as long as it isn't used close to a cotton field. This may mean within a radius of two or three miles. The application is largely by airplane and a breeze can cause extensive drifting and bring in the cotton growing neighbors with their shotguns.

Before the coming of the combine, ducks used to be a serious pest in this area. Ducks by the millions come down the Mississippi flyway every fall and winter on the reservoirs and bayous. When the rice was in shock they inflicted tremendous damage, tramping the shocks into the mud. Rice birds, a kind of blackbird, are the big grain stealers now. The current remedy is firecrackers and firearms.

The rice farmer has learned to take these annoyances as a matter of course. Rice has never known a world surplus and the price has generally been quite satis-

FARMERS' FRIEND

Cushman 780 SHAFT DRIVE TRUCKSTER

500 lbs. cap.
¾¢ per mile total operating cost

Cut out waste time lugging materials around your farm! Get the EXTRA power advantages of big vehicle shaft drive and 3 speeds forward: one reverse. Heavy duty welded steel frame, cap. nearly 10 cu. ft., pick up type body—complete with tail gate. Up to 75 miles per gallon—and up to 35 miles an hour. Do your chores faster and easier, save time and money!

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AVERAGE SOW AND GILT FARROWED 9.75 PIGS — WEANED 96% OF THEM!

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Production registry figures over a 5-yr. period.

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BERKSHIRE BOAR AND GILT SALE

Thursday April 1, 1954 at the Wayne County Fairgrounds at Wooster, Ohio.

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factory. But now he finds himself faced with a new and much more formidable threat to his prosperity. This is the cotton grower. Acreage restrictions are forcing this neighbor to seek new crops for his fields—and rice looks mighty good. Not only can he move in and get the benefit of the high supports on rice, but at the same time he can get rid of all the Johnson grass and wild millet that has been taking over his best land. A good flooding, one that will help the leaves below the water surface, will bring them under control, pronto.

There are two schools of thought on how to handle this threat. One says if the government is going to put controls on cotton it has to protect rice also. "The government can't let the cotton grower come in and ruin us and himself, too." The other school sits back rather confidently and says, "If any man thinks he can raise rice cheaper or more efficiently than we can, let him try it."

There's one point on which all rice growers are united: They know that if Americans would ever try their product and find out what a really good food it is, the per capita consumption in this country would soon surpass the 5.5 pound mark where it now stands: (in the Far East per capita consumption runs from 200 to 400 pounds) and rice acreage could be expanded rapidly without any danger of glutting the market.

WATER SOFTENERS

(*Continued from page* 79)

unless there are minor adjustments to be made to insure efficient operation, the maintenance of the unit is negligible. The tanks, if cared for properly, should last indefinitely and the zeolite or high-capacity resin has a life of up to twenty years, depending again on the care it gets and the water it handles.

The cost of salt for regenerating purposes is the only definite expense involved and it runs between two and three cents a pound, according to the quality used. The additional cost in electricity (for operating the automatic systems only) would be hard to find on the monthly bill.

The prospective buyer can choose from a number of manufacturers' models which have national distribution. Culligan, Inc. has among its models suitable for home use a 40,000-grain capacity softener which sells for $139 to $170, depending on whether a single tank or double tank unit is bought. The company's 60,000-grain model starts at $177. The 75,000-grain models sell for between $214 and $255.

The Duro Company's 45,000-grain units cost from $167 to $290 and require 22 pounds of salt per regeneration. Duro also

● Now you can have four attachments for your Gehl Forage Harvester — Windrow Pickup — Mower-Bar—Regular Row Crop, *or the NEW Gehl 2-Row Attachment* for corn, sorghum and other row crops.

Save gas, time and labor by faster filling. Half the trips across your fields saves travel time and soil packing. Save wear of tractor and chopper by cutting actual operating time in half. Increase income from custom chopping.

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Gehl Chopper with Mounted Motor does a great job two rows at a time.

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"I've studied this problem thoroughly, son. This Yardley water system pipe will not only pay off right now . . . but will save costly replacement in the years ahead."

Only Yardley ClearStream Farm Water System Pipe is PressuRated

Now you can be sure of a uniform safety factor in every foot of your cold water lines. Yardley *ClearStream* Pipe for farm use is now *PressuRated* at 75 lbs. working pressure for all six sizes — ½" through 2".

Ordinary plastic pipe is made in metal-pipe wall thicknesses. As a result, one size might be rated at 100-lb. pressure — another size only 30 lbs. With *ClearStream PressuRated*, every size is the same.

Regardless of your present pump pressures or size of the water system, use the only plastic pipe designed for present and future needs. *ClearStream PressuRated* is a better long-term investment — and in some cases costs less now than before. Also made in 100 and 125-lb. pressure ratings.

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Look for the pressure rating and the *ClearStream* name stamped on every length. For service lines or pump pipe, insist on *ClearStream*. Send for literature.

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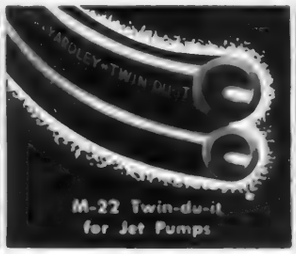
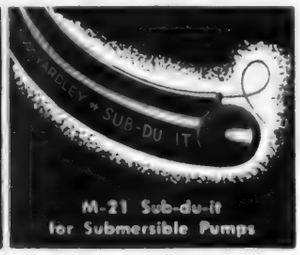


M-22 Twin-du-it for Jet Pumps



M-21 Sub-du-it for Submersible Pumps

YARDLEY PLASTICS CO., 142 Parsons Ave., Columbus 15, Ohio

In Canada: DAYMOND CO., LTD., Chatham, Ont. • Export Sales: F. & J. MEYER, 115 Broad St., New York 4, U.S.A.

produces 67,000-grain models which sell for between $174 and $390.

Various 30,000-grain units requiring 18 pounds of salt each regeneration are made by The Elgin Softener Corporation. They cost between $155 and $193. The 40,000-grain softener starts at $180.

Permutit's 38,000-grain softeners cost about $300 and require 23 pounds of salt per regeneration. This company has 50,000 and 75,000-grain units on the market as well.

Diamond Water Softeners are made by the Oshkosh Filter and Softener Company. They have a 30,000-grain model at $102 and a 50,000-grain model at $140.

Dayton Pump and Mfg. Co. makes Rapidayton Water Softeners in 25,000 to 70,000-grain units. The prices start at $159.50.

The F. E. Myers & Bros. Co. offers a line of units with or without brine tanks, with capacities of 5,000 to 185,000 grains, which start at $162.50. A half-pound of salt per 1,000 grains of hardness is required for regeneration.

Units produced by Red Jacket Manufacturing Company are the 48,000, 64-000 and 70,000-grain models which start at $177 and advance to $300.

A 48,000-grain unit is made by the Western Filter Company for about $189. The company also produces a 64,000-grain unit and a 96,000-grain unit.

Other leading manufacturers whose softeners are distributed nationally include Montgomery Ward; Sears, Roebuck & Company; Bruner Corporation; Lindsay Company; Refinite Corporation; Rheem Manufacturing Company; and Servisoft, Incorporated.

Several companies, notably Culligan and Servisoft, offer a soft-water service at a monthly fee of from $2.50 to $7.

ALFALFAS THAT SPREAD

(*Continued from page* 37)

the deep green field. It looks like a poor fellow who is suffering from a skin disease and is loosing his hair in patches. In a week or two the whole field is dead."

Today, Rhizoma can only be recommended in areas where wilt disease is no problem.

Rhizoma's Resistant Cousin

But the plant breeders have accepted the challenge of creating an alfalfa with similar breeding which has the outstanding qualities of Rhizoma and is resistant to the bacteria which cause wilt.

"The greatest development in alfalfa improvement in North America has been the discovery of the potency and vigor which can be attained by crossing with some of the *diploid falcata* types," said L. F. Graber, who has acquired a head of snow white hair and the nick-name, Alfalfa Larry, in his years of work with farmers and fellow scientists which has resulted in Wisconsin's place as first in

alfalfa production. "We owe Dr. Moe a very real debt of gratitude for making this discovery. Now, Dr. R. A. Brink has taken a very potent *falcata* stock and crossed it with some of the best domestic varieties and created a new alfalfa which he has named Vernal."

Vernal has been tested and evaluated at the University of Wisconsin and at the Utah Agricultural Experiment Station and has been found to have the vigor, winter hardiness, and growing qualities of Rhizoma plus a high resistance to wilt disease. Regarding Vernal's ability to spread itself by sending out rhizomes Dale Smith, who did much of the field testing of this new variety says, "I don't like the word "creeping" because it gives the wrong impression of the plant's growth, particularly in heavy soils. I prefer to say that Vernal, like Rhizoma, has a broad, partially submerged crown which broadens itself by rhizomal growth." Smith will admit, however, that in making a plant count—even in the Wisconsin soils—his assistants often make the mistake of counting as a new plant a clump of alfalfa which is growing from one of the rhizomes sent out by a mother crown.

Planting the Crop

Seed bed preparation, fertilizer application, seed inoculation, and depth of seeding are the same for Rhizoma and Vernal as for other varieties. It is recommended

THE FARM'S PICTURES

Cover by Oliver H. Jensen

14—Agricultural Division, Cincinnati Gas & Electric Co. 16—L. Stephan. 32—Bob Taylor. 33—Table, Adapted from *Soils and Fertility* by Firman E. Bear, 3rd Edition. 34—*Agricultural Ammonia News*. 35—Kosti Ruohomaa from Black Star; Fred Knoop. 36—Joe Munroe. 37—University of British Columbia: Fred Knoop. 38—Kazik Pazovski. 39—Chillicothe (Ohio) *Gazette*. 40—Kazik Pazovski. 41—Chillicothe (Ohio) *Gazette*. 42—Grant Heilman. 43 through 45—Joe Munroe. Top, 46 and 47—Joe Munroe. 46—Mercer, Courtesy W. R. Ames Co. 47—Bob Lachenbach, Courtesy W. R. Ames Co. 48—Fred Knoop. 49—Joe Munroe. 50 and 51—Herbert List from Magnum. 52—Dr. Reid Davis; Joe Munroe. 53—Joe Munroe. 56 through 58—*Cincinnati Enquirer*. 59—Warshaw Collection of Business Americana. 60 and 61 (top) Grant Heilman. 60 through 63—Samuel H. Gottscho. 64—W. A. Stacey. 65—Cornelius; Fred Knoop: Wood Products Co. 66 and 67—Drawings, Robert C. Smith. 68—Fred Knoop: Danuser Machine Co.: Ray Kraus from American Steel & Wire Co.: Fred Knoop: Republic Steel Corp. 69—Fred Knoop: Republic Steel Corp. 70—Joe Munroe. 71—Bob Taylor. 72—Louisiana State Rice Milling Co. 73—Rice Consumer Service, Inc. 74—Bob and Ira Spring from FPG; Standard Oil Co. (N. J.); University of California. 75—Arkansas Rice Association. 76 and 77—The Dow Chemical Co. 78—Drawing, Robert C. Smith. 79—The Dow Chemical Co. 88—Chillicothe (Ohio) *Gazette*. 92—Herbert List from Magnum. 108—Rumanian Information Service. 110 and 111—Joe Munroe. 112—Chas. W. White. 115—Joe Munroe. 124—Rice Consumer Service, Inc. 131—Tony Basso. 140—Kazik Pazovski. 144—Carl Mansfield. 148 and 149—R. J. McGinnis. 150 and 151—Cas Oorthuys. 153—Fred Knoop. 154—U. S. Forest Service Photo: Fred Knoop. 156—J. W. McManigal. 158—Republic Steel Corp.

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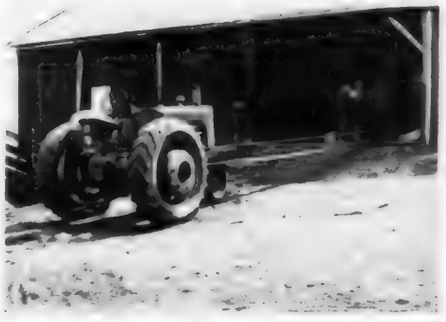

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HYPOID BEVEL PINION AND RING GEAR
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Available with wide front axle

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We Increased our Profits Year After Year, Say These Successful Farmers

With an *Eversman* AUTOMATIC LAND LEVELER AND HYDRAULIC SCRAPER

Ashkum, Illinois—My cost of installing a surface drainage system, smoothing and seed bed preparation on 110 acres with my 289 EVERSMAN Leveler, amounted to about $300. My yield on both corn and soybeans increased at least 95% over 1952 yields. I had one of the best looking stands of alfalfa in Illinois this summer, and in past years I couldn't even grow alfalfa on this field due to poor drainage. We had 5½" of rain in 24 hours in July, but the surface water disappeared before it damaged my crops.

John Ash

Eldorado, Illinois—We have used a 289 EVERSMAN Leveler for 3 years, and we feel it has benefited us approximately $1100 a year. Our chief interest is growing certified seeds. With the Leveler, in one operation, we smooth and prepare better seed beds—seed beds in which the grain will be in the soil at a uniform depth. This results in substantial yield increases and harvesting conditions are definitely improved, permitting the combine to be set lower and the ground shaved.

C. J. Wagner, Carter & Son Sunset Farms

Dexter, Missouri—Our system of farming bean, corn, cotton and wheat ground is to plow, disc once if the stubble is rank, and then level 3 times in opposite directions, the last time in the direction of planting. My four 12PL Levelers have helped solve our biggest problem which is drainage on tight soils, and the EVERSMAN Leveler is the best seed bed preparation tool I have found.

Eugene Lane and Sons

Mendon, Illinois—We purchased a badly eroded farm full of gullies, and after leveling we have little erosion and increased production each year. On the bottom land we used to have water pockets that would winter kill wheat or clover, but these places have disappeared. We use our EVERSMAN when we have a dry, cloddy condition as a tillage tool. On rolling land it leaves the surface smooth and free of small gullies so rain spreads over the surface evenly, reducing erosion.

Chester Miller and Sons

Linton, Indiana—As we have tight soil and unlevel ground covered with pot holes, the EVERSMAN Leveler has proven to be a good investment by helping us smooth land and fill pot holes, which has resulted in greater yields. Without question, it should be placed along with the plow, cultivator, combine, etc., as a standard piece of equipment on most Indiana farms.

W. S. Wilkey, Paul Thompson Farms

Here is a complete tillage tool which breaks clods, mulches the soil, makes a firm, well packed seed bed while automatically leveling, which holds moisture, makes planting uniform, cultivating easier and harvesting faster, resulting in greatly increased yields.

FILLS POT HOLES

With an Eversman and your own tractor it's easy to move dirt, fill pot holes, build farm-over type drainage ditches, and obtain complete surface drainage—fill gullies, build grass waterways, straighten out terraces on hillsides.

Now available in six all purpose (mechanical or hydraulic) models with springtooth attachment for four models.

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AUTOMATICALLY UNLOADS

Chopped Hay • Ear Corn • Corn Silage

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HELIX CORPORATION
DEPT. 2-D CROWN POINT, IND.

This Convey-O-Matic wagon unloader unloads *everything* . . . chopped hay, ear corn, corn silage, small grain, fence posts, gravel, dirt and lime. "It floats the load," on an acid-resistant conveyor belt which lasts a lifetime. 2 ft. extension sides available to suit job. 20 unloading speeds.

If you want to unload any material at right angles into feed bunks, self feeders, ensilage blowers, small portable elevator hoppers, one man can do the job from the tractor seat with a new attachment — the Helix-Cross-Conveyor.

CONVEY-O-MATIC "IT FLOATS THE LOAD" **WAGON UNLOADER**

that Vernal be seeded at the same rate as other alfalfas, but Dr. Moe recommends that Rhizoma be seeded at the rate of about 4 to 6 pounds. He believes that the failure of Rhizoma to spread in some sections may be caused by overseeding.

Seed for Rhizoma has been in short supply, but can be secured through most seed dealers today. Seed for Vernal will not be readily available for another two years. The job of pushing production of seed of this valuable new plant has been taken over by the National Foundation Seed Stock Project. This organization selects farmers in the west who raise the foundation seed of the new variety in complete isolation and under careful supervision and produce fabulous seed yields running as high as 1400 pounds of seed to the acre. The foundation seed is then distributed for the production of certified seed.

"It used to take us fifteen years to get enough seed to put a new variety onto the farm," Dr. Graber said, "Now, with the cooperation of western growers and a national group to supervise the growing, we can look forward to five million pounds in two or three years and as much seed as we want after that.

"At my age, I like to look back, but I like to look forward, too," Dr. Graber said running his fingers through his shock of white hair, "and I think I see what is ahead for the alfalfa grower. This *diploid falcata* stock and the ability of the plant breeder to obtain wilt resistance has made it possible for us to produce an alfalfa the farmer can grow as long as he wants and plow up when he wants to. Up to now a farmer has plowed up his alfalfa when he had to and usually there wasn't much there to plow. Soon he will have an alfalfa which will produce a vigorous growth as long as he wants to leave a field in alfalfa and when he plows he will be turning under a mass of green stuff and tons upon tons of root material to add to the fertility and tilth of his soil."

CALF SCOURS

(*Continued from page* 53)

whether these drugs would have a growth-stimulating effect with calves as they do with pigs and chickens—they do.

Dr. Hellmut Kafka, a Peruvian veterinarian, reports a spectacular case in which 90 calves, the entire crop from the farm, had died of scours during a single year. He recommended that the farmer give each new calf a 100 milligram capsule of terramycin as a prophylaxis. This treatment, Dr. Kafka claims, reduced the mortality from 100 per cent to zero.

One of the most interesting developments in the prevention of calf scours

comes from the laboratory of Dr. Karl Paul Link, the University of Wisconsin scientist who produced Dicumarol, the drug which has saved hundreds of thousands of lives previously lost because of blood clotting, and Warfarin, the closely related drug which has killed millions of rats on our farms. Dr. Link became interested in the scours problem while he was working on Dicumarol. His work was being seriously hampered by the loss of 85 per cent of his laboratory rabbits from scours. He found that when he fed them colostrum from dairy cows he was able to cut his losses to 15 per cent: but colostrum isn't always available. He tried whole milk, skim milk, sour milk, buttermilk, condensed milk and dried milk as substitutes, but none would take the place of colostrum.

Link finally hit upon a line of reasoning which solved the problem. Since the most important ingredient in colostrum is the immune bodies which it gets from the blood of the cow, why not use the blood itself? After a great deal of experimenting he produced a material which not only saved the lives of his young rabbits, but is now perfected for use as a scours preventive with calves.

In its final form, Dr. Link's preparation contains 100 grams of dried blood serum from dairy or beef cattle, 25 grams of partially digested milk solids, and 50 milligrams of vitamin K. The blood serum, carefully dried under refrigeration to prevent deterioration of the antibodies, gives the calves an even greater protection against disease than colostrum. The vitamin K which is a blood coagulation promoter, helps to heal the many small internal hemorrhages which are normal to the new-born calf and which provide entrances for germs into the blood stream. The partially digested milk solids act as a carrying material for the other two agents and also provide the calf with quick nourishment.

This dried material is mixed with a quart of warm milk or water and half of it is fed to the calf as soon after birth as possible. The remaining pint is given around 12 hours later.

Dr. Link's preparation is not a remedy for the treatment of scours, but a preventive. Given too late, after the calf is sick, it has reduced value as a cure.

The first test of the preparation was on the Biltmore Dairy Farms in North Carolina under the direction of Dr. Chris Segard, Medical Director for the Wisconsin Alumni Research Foundation, and Dr. Arthur B. Christian, who is in charge of the health of 1,400 purebred Jersey cows. When the test was suggested to him, Dr. Christian pointed to the well-stocked shelves in his dispensary and said: "Look, I've got twenty-five scours remedies, why should I fool around with another one?" After Dr. Christian had reluctantly tried the new material on a few calves, he became enthusiastic about the experiment and set up his own test. Every other calf born on the farms was given the new prep-

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aration along with the colostrum it got from the cow. After feeding the preparation to more than 300 of the calves, he found that only a little over six per cent of them showed any signs of diarrhea and, of these, only two died. Of the control group some 21 per cent came down with scours and 13 of these died.

The severest possible test of the new material was proposed by Dr. Link, and Dr. Christian agreed to try it. Sixty-eight calves were taken from their mothers before they could get a drop of colostrum and fed the new preparation along with regular cow's milk: an equal number of calves were given colostrum only. The results: none of the test calves had calf scours while many of the colostrum-fed control group had scours and four of them died within 48 hours.

An incident which occurred early in the test served to point up the value of the material. Dr. Christian ran out of the experimental material and was unable to get more for a period of 33 days. "During this period, seventy-one calves were born," Dr. Christian said. "Twenty-one of them developed diarrhea, fourteen of them within seventy-two hours after birth. Nine of the fourteen died. This was a serious outbreak. We had not experienced this type of diarrhea while feeding the preparation nor did we again have an outbreak of this kind after supplemental feeding was resumed."

Today, the Wisconsin Alumni Research Foundation produces Dr. Link's scour preventive under the name KafmalaK. This is the first venture of the Foundation, which licenses the production of Warfarin and Dicumarol, into the field of production and distribution. They have done so in an effort to hold down the price of the preparation to a point where it will be economically sound for a farmer to use on all of his calves. As we go to press, the first distribution is being made from the offices of the Wisconsin Alumni Research Foundation, 209 South LaSalle Street, Chicago, Illinois. With KafmalaK on the market, Dr. Link is hard at work testing out this and similar formulations as scours preventives for pigs and lambs.

Curing Scours

When a calf comes down with scours, the first sign is listlessness—head down, back humped up—and a refusal to eat. Then comes the diarrhea which is watery, usually white, and has a sweetish, sickening odor. As the sickness progresses the calf becomes dehydrated: its skin becomes dry and its eyes sink deep into the sockets. The tail and rump become smeared and the calf loses the hair from this area and its skin becomes inflamed and sore. At first the calf runs a fever and breathes rapidly; later, before death, its temperature drops below normal.

Since scours act quickly, the first thing a farmer should do is to call his veterinarian who will treat the animal with one of the sulphas or antibiotics or a serum taken from the blood of cows which have been heavily infected with bacteria which cause scours. On the other hand he may administer a blood transfusion from the mother cow—a treatment which has pro-

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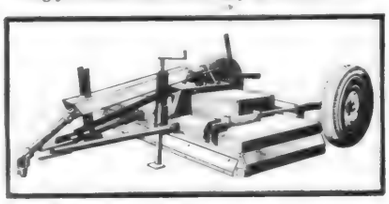

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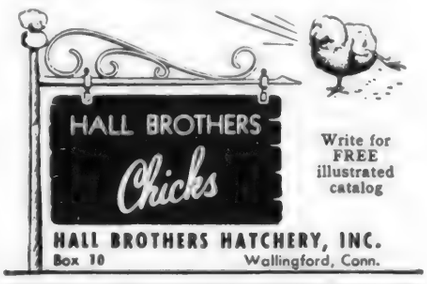

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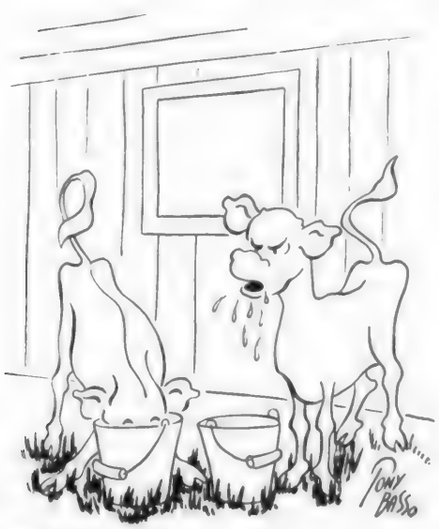
duced some remarkably good results.

The calf should be separated from the other calves to prevent the spread of the disease and should be kept free from drafts. The amount of milk being fed should be cut in half to relieve the burden on the digestive tract. This automatically cuts the amount of liquid which the calf is getting and since dehydration is one of the results of scours, the calf should be given as much warm salt water (one teaspoon of salt to a quart of water) as it will take. Another home remedy which has been proved effective is to stir a teaspoonful of powdered kaolin into the milk at each feeding. Kaolin is not a medicine in the sense that it will attack the germs which are causing the sickness, but it does help prevent the absorption of the poisons in the intestines and helps firm the waste matter and bring an end to the watery diarrhea.

Another feeding recommendation is to stop milk entirely when a calf starts to scour and feed in its place an equal amount of barley water until it has recovered. The barley water is made by pouring four gallons of boiling water over three quarts of cracked barley and allowing it to steep until it cools.

The smeared rump, legs, and tail of the calf should be washed once a day with a mild antiseptic solution to protect the skin. And the farmer should use a stronger solution to wash off his hands and rubber boots after he has worked with the calf in order to prevent the spread of the disease.

Even with the best care, many calves which come down with scours will die and those which survive a bad case of scours will be set back in their vigorous growth. These are the reasons why the greatest emphasis should be on preventing the disease rather than on its cure.



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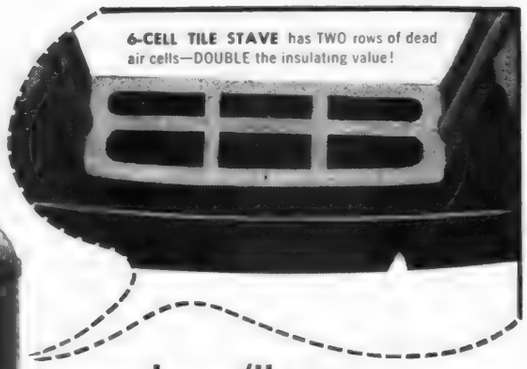

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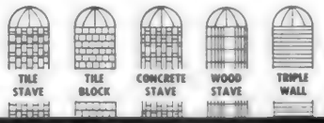

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CHICKEN PAPER

(*Continued from page* 43)

Profit and loss were to be shared equally. The success of that idea caused other growers and feed dealers to copy it, often with the feed dealer's cut reduced to one-fourth. Then competition brought the dealer's profit down to 10 per cent and later to only his regular feed markup. In time a guaranteed profit was thrown in for the producer, with the feed dealer taking the loss, if any. But feed sales boomed.

During and after the war, national feed companies, the manufacturing mills, pushed the broiler program to sell more feedstuffs. They were forced to sell on credit to their local retail dealers so the latter could extend credit to the growers. The manufacturing mills also sold feed on credit direct to large growers, as they do today.

Feed on credit is only one aspect of broiler financing. Invested capital provides wide backing. Five general grower-backer arrangements stand out:

1. The grower owns the houses and equipment and provides the labor. The backer, often a feed dealer, provides the chicks, feed, disinfectants, etc., the retail cost of which is first taken out of the income when birds are sold. The balance of the income is divided, the grower receiving two-thirds to three-fourths. If income does not cover expenses, the backer takes the loss. This is on a contract basis, with no notes or security involved, and the grower at no time has title to the birds. Where feed costs are figured at wholesale, as in Maryland, the feed dealer's cut is generally half of the profits.

2. Similar to No. 1, except that the backer pays the grower an agreed amount per 1,000 chicks raised for labor and the use of houses and equipment. The backer takes all receipts. This is varied on a tenant deal wherein the operator or grower owns nothing and gives only the labor for a percentage of the profits over expenses or a stated amount per 1,000 chicks (either on a started or raised basis), often with bonuses for efficiency.

Meigs County has only one backer (a hatcheryman) offering such an arrangement. He pays growers 15 cents per chick raised for labor and use of housing and equipment, but markets the birds himself, taking all profit or loss.

3. A straight loan from a lending agency which supplies only the credit at a normal rate of interest, with or without technical supervision. Title to the birds plus other security is usually signed over as collateral.

4. Similar to No. 3, with the grower giving a secured note to the bank or other lending agency, but instead of being advanced money, he is given feed or other needed items, including chicks, by a deal-

er, who makes his profit on such items sold at retail. The dealer collects from the bank on his invoices as he delivers the feed or supplies. The grower pays interest on this money from the day the items are delivered until the note matures at sale time, when he pays off the bank. Income above expenses is the grower's profit, just as if he were on a cash basis.

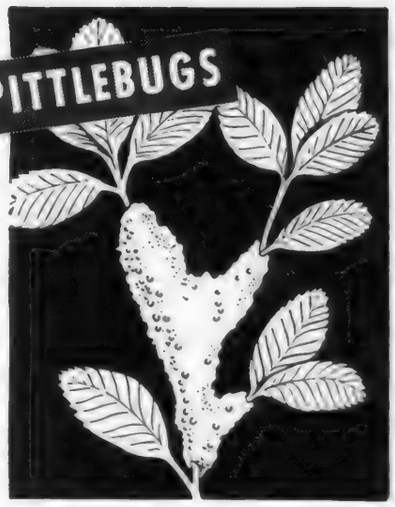
5. No local feed dealer is involved where large feed manufacturing mills extend considerable short-term credit to big broiler operators, usually for feed only. The security varies and a lending agency may or may not be in the picture, according to the manufacturer's ability to carry outstanding accounts.

Pitfalls for the Grower

Each arrangement has its good and bad points. Credit can be high, wide and deceptively handsome in a business where even the sale of feed bags sometimes means the difference between profit and loss. Easy terms encourage in-and-out opportunists who too often depress the market with inferior birds or give the industry a black eye in one way or another, besides the losses they cause through poor management.

If a farmer operates purely on borrowed dollars, he assumes all risk of loss through disease and skidding markets and seldom receives much technical supervision on a straight loan deal. But he gets all possible profits. Where feed and chicks are furnished by someone else, the farmer's risk is lessened, but the backer expects a high cut on the profits to offset the possible loss. But a grower can expand to the most efficient usage of his time and facilities through such backing. The collateral he could offer might not be sufficient for a bank to finance him to that same degree. If a dealer furnishes feed and other items on credit which is signed for by the grower as a bank loan, the greatest risk is overexpansion, with possible loss of not only labor but of the heavy security banks require. In this instance, a farmer may get some technical advice on management of the broilers, but the market outlook is his own problem. If a man has sufficient security, feed dealers are likely to encourage feed sales and banks are likely to provide the money even when the market is doubtful.

Where birds are raised on a contract basis, the farmer, by risking only time and labor (plus depreciation on his facilities), forfeits the chance for exceptional profits by accepting a guaranteed sum per bird. Quantity is his only goal and disease his major risk problem. Weight and quality are ignored. Such a contract might offer only wages or less, for it is not difficult to find a speculator who is willing to split all profits, or guarantee a stated sum per bird raised, on the chance he will not have to face the loss he agrees to accept. However, some deals of that nature, with close cooperation, have been



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profitable to all concerned. In the Southwest, dealer J. D. Howard provides everything, including veterinary supplies, for one-third of the Shelby County, Texas, growers, most of whom are small side-line operators furnishing only the brooding houses and labor. Howard also has four demonstration plants where he attempts to set an example in the latest management techniques.

In other cases, growers have become hired hands without any assurance of salary from one-sided contracts or have sometimes mortgaged themselves heavily through misalliance with sharp broiler-promotion creditors, who fortunately are few to crop up and brief to flower. Still other farmers have found that controls imposed on them by lending institutions can smother free enterprise, as for example by directing the use of certain feeds, or chicks, or practices.

Anemic Accounts

The end of the fancy profits in poultry meat came in late 1951. Production exceeded demand, yet the bubble hovered unbroken for many growers and feed dealers. Expansion went on. Credit continued and grew. The growers owed the feed dealers and they in turn ran up big debts with the manufacturing mills. Serious losses began and increased for the manufacturers, but they were too interested in sales to heed the warning. In 1945, eight major feed manufacturers had *47 million dollars* outstanding in unpaid feed bills when they closed their books at the end of the year. At the close of 1951 those same eight companies reported *131 million dollars* as due them on uncollected feed bills. With sales increasing 165 per cent, "accounts receivable" had jumped 280 per cent, and debts written off as bad were equally out of proportion.

Those unpaid feed bill records, from only eight out of 8,000 feed manufacturers, represent only a small portion of the financing behind the broiler industry, which increased from 35 million commercial broilers in 1934, when credit became typical, to above 900 million broilers on the market last year. Over 60 per cent of the 34 million tons of manufactured feed produced in 1953 went into poultry. Much of it was financed with chicken paper. Entire broiler operations from feed and equipment to chicks and housing were provided with capital by banks, hatcheries, processing plants, manufacturing mills, local dealers, marketing agencies, and Production Credit Associations. The latter consider an applicant's all-over and long-term possibilities, before mapping a financial program.

With the slackening-off in the market came no slackening-off in the demands for credit by the growers. The manufacturing mills and the local dealers, with competition breathing hotly down their necks, found that more and more credit was the only answer to upholding sales of feed.

NEW "Year-Round" Ventilation PAYS OFF EVERY MONTH

Extremely important to your farm profits is proper ventilation. Your animals are healthier, production goes up and you protect your buildings from rot and deterioration. Now for the first time, flexibility of operation permits correct ventilation regardless of outside temperatures and changes in the number of animals housed or growth of birds such as in broiler houses.

The new Louden ventilation system makes money for you the "year-round" — provides healthy quarters for livestock and poultry during the cold months and keeps them comfortable during the hot summer months —comfort that means greater weight gains and high production!

FREE to farm operators. Learn how this latest advancement in farm building ventilation operates. Send now for free folder.

The Louden Machinery Co., 323 S. Court Street, Fairfield, Iowa

LOUDEN

THE GRADE-A LINE OF BARN EQUIPMENT

Easy money, the point of optimistic take-off, had made the circle in bomerang fashion and became the point of rough roosting.

In 1953, alarmed feed manufacturers initiated a campaign to clear the atmosphere in their own credit dealings. Through recommendations of The American Feed Manufacturers Association, companies are voluntarily tightening financial requirements to safeguard their own futures. Feed salesmen are becoming risk-minded, for sales volume means little where red ink dominates the ledger at year's end.

Leave Banking to the Bankers

As financial commitments mounted for the manufacturing mills, they exhausted their reserves and turned to the banks. Consequently banks are coming to the forefront because both manufacturers and feed dealers are trying to get out of the banking business by encouraging more direct transactions between bank and grower. Local bankers are likely to have a good understanding of a grower as a credit risk and, having nothing to sell but a lending service, they look on a loan with cool detachment. This is developing a more stable, healthier industry.

Banker Hobstetter says: "Bankers aren't poultrymen nor should manufacturers or feed dealers be expected to assume the role of bankers. Luckily we have a hatchery man here who knows his business. He

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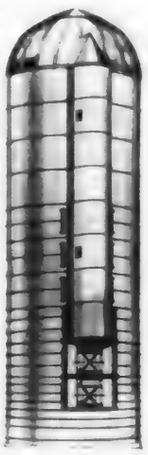
A well planned grasslands program starts with a 1954 Marietta silo. Order your Marietta silo now . . . in time for this spring's grass crop. Be assured of brighter prospects for the longest possible pasture season. Yes, a Marietta silo means better feeding with less work, less worry from droughts, lower farming costs.



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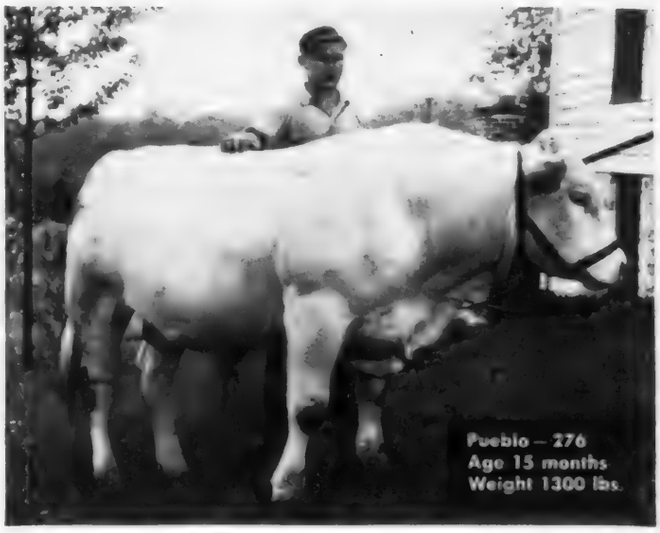

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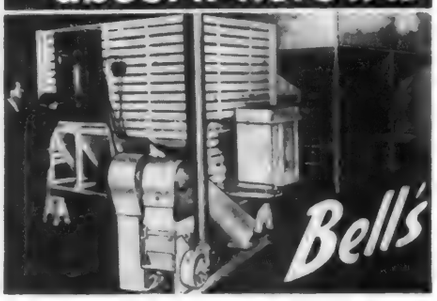

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produces quality chicks and keeps a watchful eye on them by advisory supervision of a feeder's management up until marketing day. The bank accepts his judgment of a farmer's ability as a grower. It is the bank's responsibility to its depositors to weigh a man as a credit risk. We try to select broiler-minded farmers to finance, preferably those who own their farms with some livestock or equipment for collateral and with no large debt accumulation. We encourage reserves from each sale of broilers, for the tendency has been too much in using profits for further expansion, requiring greater credit to carry on. The low profit margin makes it necessary that, except for side-line growers, flocks should average 15,000 birds per operation. The same equipment is used for four batches annually, on an all-in, all-out basis, with a good house cleaning between.

"Careful screening of the producers to be financed is the key. In 17 years of broiler financing on a sizeable scale, we have yet to lose one cent. I know of only one small loss incurred years ago by one of our feed dealers whose customer shouldn't have been in the broiler business in the first place."

In California, where birds are marketed at nearer the four-pound fryer weight instead of the usual two-and-a-half or three pound broiler weight, bank loans often involve a contribution of five cents per sack of feed for a reserve pool to cover possible losses. This reserve is divided between bank and feed company after losses for a given period are determined.

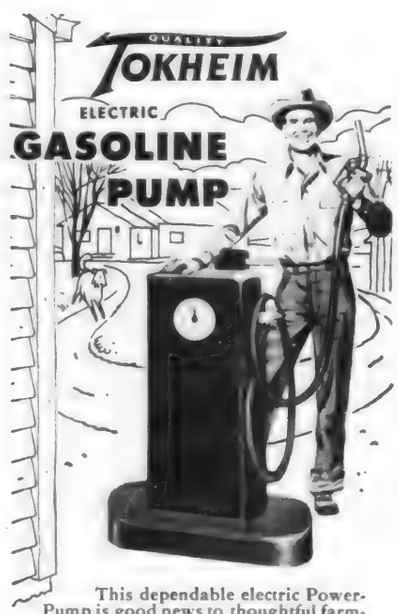
Other Credit Lines

In some parts of the East, especially in Delaware, a big chicken state, it is believed that the banks are not the best lending agencies. W. T. McAllister, Delaware Extension Marketing Specialist, has this to say of bank loans: "Banks and other credit agencies should be the credit agency for the broiler industry. And, to a great extent they are in so far as they furnish feed dealers and manufacturers the credit they need to finance individual growers. However, I seriously doubt if our broiler industry would have developed as rapidly and efficiently if it had waited on local lending institutions to supply the credit on an individual grower basis.

"There are about three reasons why the feed dealers and manufacturers can do a better financing job than banks.

"1. Banks sell only credit—their only return for financing broiler feeding is interest. Feed dealers, hatcheries, manufacturers, etc., have two sources of return with which to hedge their investment. The first is interest just like the bank, which most of them take. The second is a margin on the feed and supplies sold. In the short run, such as a depressed market condition, dealers can afford to lose all their interest and even a small part of their operating margin and still continue to operate. Historically banks 'clam up' on high-risk loans

QUALITY TOKHEIM ELECTRIC GASOLINE PUMP



This dependable electric Power-Pump is good news to thoughtful farmers. Always ready for instant use in fueling cars, tractors, trucks and other farm machinery; it saves time, work and worry because it is so much safer than other methods of gasoline transfer. Only 39 inches high. Delivers 10 gallons per minute. Rugged enamel finish. UL approved. See your Tokheim representative or your oil company.

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(Trees up to 5" Dia.) use with any tractor. Wt. 19 lbs. Add $1.45 P.P. & Ins. West of Miss. $1.95

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when the going gets rough. It might add more rather than less fluctuations to the industry.

"2. It is questionable if banks could give adequate supervision to flocks they finance. Part of the interest and margin growers pay for feed now goes to pay for this supervision. Banks would have to make similar charges. While banks are interested in the welfare of the grower, basically they are interested only in protecting their investment and earning a return in the form of interest. Most of the financing contracts locally not only provide for this return but provide for some share of the profit for the financing agent. While this is a direct charge to the grower (might be considered as interest, service, and risk), it does give the feed dealer an extra incentive to maximize returns from each flock.

"3. By individual financing each grower would be on his own as far as buying and selling is concerned. It might be questioned as to whether large organizations cannot buy and sell to better advantage than the small individual grower. Of course, if banks want to get into the broiler business they can act as the agents for the grower.

"The experience of some growers with bank financing has been the loss of their farms, homes, and business when the tide turned against them. Today, they would rather shift the risk completely onto someone else and take less of the profits. Usually banks are not interested in covering this risk for the grower."

What Credit Can Do

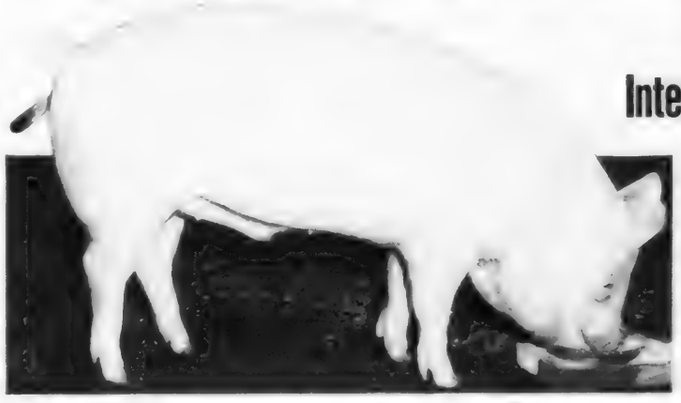
In addition to expanding the industry in the growers' and feedmen's interests, wisely planned credit programs can weed out the gamblers and unfit poultrymen, discourage the deadbeats and offer supervision in both orderly budgeting of funds and efficiency of operation. Sanitation and disease control, scientific feeding practices, and timely marketing come under a watchful credit man's concern. Feed company field technicians working as a team with bankers are helping themselves and the farmers as well. Policy now demands coordination between production or expansion and customer demand.

After Hobstetter passes an applicant as a credit risk, they sit down together to estimate expenses, including living expenses, that will be confronted during the loan period. Then income is estimated. This is the joker, for judging the price of poultry three months hence is guesswork.

"A producer has to see his way clear through the season. We try to anticipate everything. Amounts and terms have to be flexible, but that doesn't mean speculative lending brought on by periods of high profits."

Detailed financial statements are usually required, with hazard insurance covering the birds. Ninety-day notes are the rule, made payable to the bank. As feed is delivered, the feed dealer collects from

GRAND CHAMPION of all breeds at the International



OSU's Champ II — top prize-winning barrow at the 1953 show

for prizes or profits feed Sacco V-19 Mineral

Top awards in many classes went to Ohio State University at this great livestock show. Among them were Grand Champion and Reserve Champion barrows and Grand Champion pen of three *over all breeds*. These sweeping awards to OSU prove again that good feeding, good breeding and good management team up to produce champions. For many years Sacco V-19 Mineral has helped livestock raisers produce champions and make profits. Have Sacco V-19 included in all your feeds.

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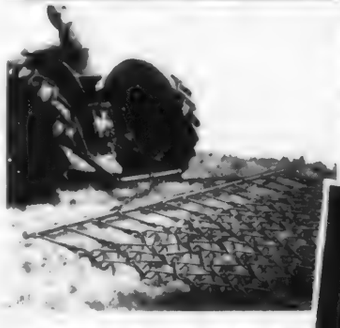
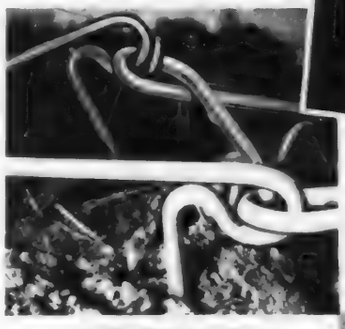
FIRST F-L-E-X-I-B-L-E TINE HARROW



Can't be beat for breaking up and spreading droppings. Hitched behind a distributor it will thoroughly work fertilizer off grass so cattle can't get any. Does a thorough job in stimulating vigorous pasture growth. Use it behind disk harrows and with grain drill. Reversed, it becomes a chain harrow.

THE LOW COST IMPLEMENT THAT KEEPS ALL PASTURE LAND IN TOP CONDITION



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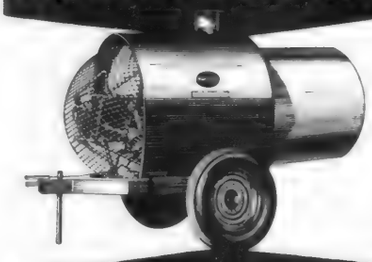

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A Hartzell crop drier packs the punch for a fast drying job. The powerful Hartzell unit forces the heated air into the heart of your batch drier, bin or mow. And that's what it takes to insure fast, complete drying. Faster drying saves time, saves fuel. Hartzell power puts money in your pocket.

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When you have a short growing season, a week's "head start" makes lots of difference. That's why so many farmers are buying Towner's new A plow, which will get into the field earlier. It is designed to operate in moist, sticky soils that cause ordinary plows to plug.

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the bank on the signed feed invoices. Some banks have set up a chattel mortgage system which calls for the operator to own two animal units, such as two cows or ten ewes or equipment of certain value as security for each 1,000 chicks started. The Pomeroy bank charges a regular 6 per cent interest, which does not begin until a needed item is delivered. The broilers are usually ready in ten weeks, but 90-day notes offer a little leeway. Under a new non-secured loan plan operating in Connecticut, banks advance a grower the cost of six tons of feed per 1,000 birds started. The interest charge is one and a quarter cents per chick, which figures about seven per cent. Some feed manufacturers who do their own financing charge no interest unless a customer defaults on his payments, but security of far greater value than the feed itself must often be signed over.

The tendency of backers, whether feed companies or lending agencies, is to invest a stipulated sum per bird, usually between 50 and 75 cents at present, with feed the main item financed, and limited to manufactured feeds at a definite poundage per bird. Where producers have some of their own money invested, as by paying for the chicks, they are more prone to be interested in the business. Policing the account through periodic inspection by fieldmen has begun to curb some of the abuses of loose credit.

No selling price is guaranteed the grower in any of the financing arrangements. In Meigs County, two processing plants have lately been erected, with a number of buyers represented there, resulting in sound marketing practices, and with prices determined by those prevailing at the nearest terminal market, transportation considered. In some parts of the nation, the dealer controls the time and place for disposal of the fat birds, which could put the grower over a barrel.

It Won't Work Everywhere

Far-seeing credit agencies have been behind the scenes wherever the broiler business has flourished. Although the enterprise requires very little land and is hardly dependent on soil fertility, there are factors common to all areas known for successful broiler production. From a health viewpoint, well drained soil that dries quickly as in hilly country is necessary. Year-round passable roads are needed for transportation. Cool summers and mild winters contribute and winds aid ventilation. The ratio of transportation of feed as compared to the cost of transporting dressed birds to consumers must be favorable. Dressing plants must be built, for delivery of live birds and great distance means more weight to transport and more shrinkage. These things involve planning and it is usually invested capital which is capable of carrying out the plan.

Eliminate GATE Worries

It's time to replace those tired, worn-out, heavy gates and start livin' a life of easy passin'. These aluminum or steel patented gates assure "Life-Time", tough use and maintenance-free service. They cost less to own. Dollar for dollar the value can't be matched.

Strong, Light and Beautiful Sizes 4 to 16 foot ready to hang Also made in galvanized Springsteel for low cost Ask for "Life-Time" gates at your lumber dealer or Farm Supply Shipped from 12 Factories in United States.

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Don't cull good cows, lose identity of purebred calves, make errors in breeding and ownership. Use these big numbered brass tags with strong 40" steel chains. **Specify numbers wanted.** Order **ZC999,** 10 for ..... **$12.95** ppd.

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You don't have to be a cowboy to find 100 uses for a good lariat like this. Heavy duty, good quality pure manila 30-ft. rope. Standard honda. Order **ZC375,** ppd. **$3.98**

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Without obligation, write for full information and list of professional Farm Managers or Rural Appraisers for your area.

H. E. Stalcup, Secy.-Treas.
American Society of Farm Managers and Rural Appraisers
Box 67, Storm Lake, Iowa

OVER THE BACK FENCE

(*Continued from page* 12)

Let Them Eat Grass An English scientist, Norman C. Wright, and a very thoughtful man he is, asks the question, "Why not a vegetarian diet?" The meat we eat, Mr. Wright says, has been converted from grass in a very wasteful manner by livestock. Why not eat grass ourselves, and save this waste? "At first sight," he says, "this is an attractive thesis. Not only is the gross weight of the world's livestock population at least twice that of the whole human race, but domestic animals eat five to ten times the amount of food consumed by man."

Mr. Wright concludes, however, that there are very many good reasons for keeping some meat in our diet. But he warns we must breed more efficient livestock or we'll wake up some near future morning with more people than we can feed.

Wheat Champ and Wheat Facts An Englishman, Dick Turrell, looked down his long nose at American farmers last year when he visited this country. And well he might, for Mr. Turrell had raised 124+ bushels of wheat to the acre the season before for a new world's record. It was a good wheat year in U.S.A. last year, too, and farmers around the wheat states were bragging about 40, 45, and even 50 bushels to the acre. But we needn't feel too badly about being bested by an Englishman. Out in Washington in 1898 a farmer came up with 117.5 bushels to the acre. After we got into the records we came upon some other interesting figures. The ten-year national average for the U.S.A. is 17.7 bu. For the Netherlands it is 61 bu., for Denmark it is 53.4 bu., for Austria it is 52.1 bu., and, alas, for Russia, 10.7 bu.

How About a Hump Stew Every schoolboy knows that the hump of a camel is a fibrous, spongy lump used as a storage tank. Most people who don't know Brahman cattle assume that the hump on that breed was provided by nature for the same purpose. Such is not the case, as one can see if he inspects a hump on the butcher block. The Brahman's hump is good, red meat, a sort of continuation to the forerib covering. On a well-finished Brahman it is marbled like the rib roast, and is just as tasty and tender.

Bread by the Billion Not long ago THE FARM published a little squib about a river of milk flowing across the country and now someone has come up with some figures on bread. The U.S. supply of wheat is 1.788 billion bushels. This is a figure that even Einstein can only dimly comprehend. However, re-

NEW Behlen Farm Unit Dries . . . Handles . . . Stores Grain!

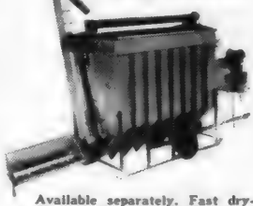
COMPLETE Unit for $1.00 Per Bushel of Storage Space

Straight Combine All Your Grain, corn included, run it through Behlen Drying Tower and Heat Blower (*right above*) and then into attached storage bin. No shoveling, no leveling; built-in augers do the work. That's the BEHLEN GRAIN DRYING, HANDLING, STORAGE UNIT! You get a Behlen crop drier, 11,000 bu. storage space, and all equipment for handling entire job mechanically.

Cut Crop Losses with Drying Tower! Harvest small grains early to avoid wind, hail, heavy rain—get corn in ahead of cold weather, frost damage. Many farmers upgrade corn and other grains—boosting profits with Drying Tower and Heat Blower alone.

New Drying and Storage Unit handles MORE GRAIN for LESS MONEY. First cost is low because entire unit is Behlen-built. (Only one manufacturer's profit in it.) Get all the facts. Write TODAY for full information.

BEHLEN DRYING TOWER AND HEAT BLOWER



Available separately. Fast drying. 358 bu. capacity. Portable. Write for folder.

BEHLEN MANUFACTURING COMPANY

DEPT. FQ, COLUMBUS, NEBRASKA

NO BUILD-UP OF IMMUNITY WHEN YOU USE

PYRENONE*

*Reg. U. S. Pat. Off., U.S.I.

An easy, economical way to control flies is to use Pyrenone sprays in the automatic spray unit developed by the Illinois Natural History Survey.

Flies that develop a resistance to other insecticides are easily killed with Pyrenone. Flies do not build up an immunity to Pyrenone insecticide in farm applications. Of course, Pyrenone is safe for use on animals and in milk houses because it has no hazards to people, animals or food. Pyrethrins, the base for Pyrenone, have been used for over 30 years as safe, fast killing insecticides. And now pyrethrins have been made about 16 times more effective by the addition of Piperonyl Butoxide to make Pyrenone. This means greater economy and a more stable product for you.

Flies can be controlled effectively—yet with safety—at less cost with Pyrenone. Flies are knocked down swiftly, and stay down. Look at the label when you buy fly spray—be sure it contains Pyrenone (or Pyrethrins and Piperonyl Butoxide.)

Pyrenone* INSECTICIDES

BOWSHER
PORTABLE and STATIONARY FEED MILLS

Give You FASTER LIVESTOCK GAINS

Don't burn Your Corncobs! . . . Turn them into profitable Low-Cost Roughage with a BOWSHER MILL . . . perfect for grinding corncobs, ear corn, shucky corn and shelled corn, giving a granular product WITHOUT DUST.

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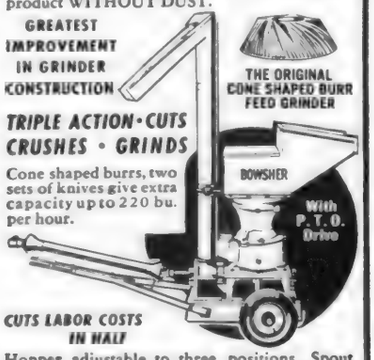

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Hopper adjustable to three positions. Spout swings in complete circle, saving shoveling.

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Save Time . . . Money
ON NON-SETTLING COWS
ask your veterinarian about
DINOVEX

• Here's good news for dairymen with hard-to-breed cows. Now available is a product that is solving conception difficulties when the problem is insufficient production of estrogen during heat. If you have cows that come in heat but fail to settle, let your local veterinarian make a diagnosis and, if necessary, prescribe and administer Dinovex.

BOVINE SEMEN DILUTER

Another aid to conception when artificial insemination is practiced. Bovine Semen Diluter is ready to use. Contains 4 anti-bacterial, and anti-fungal agents to safeguard against airborne contaminants. Unsurpassed in convenience, safety, economy. Ask your local supplier.

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Animal Industry Division, Dept. FQ-SP
Raritan, New Jersey

Please send more information on
____ Dinovex ____ Bovine Semen Diluter

Name_____
Address_____
Town_____ State_____

duced to terms of bread, it would make about 105 billion 20 oz. loaves, or 653 loaves for every man, woman and child in the country. It would make 43 loaves each for every person in the world. Either way you figure it, it's more bread than we, personally, can use. Since mother quit baking her own bread we haven't cared much for the pale, tasteless product we buy. We are all for casting it on the waters.

Gate Latch An ingenious gate latch which locks when you close the gate can be made by bending a length of strap iron. The one shown here was rigged up by an inventive Indiana poul-

tryman. Omer Smith, for his poultry pasture. The latch is made from any strap iron that is handy: the size isn't important as long as it is long enough and thick enough to hold the bends. At the point where it is fastened to the post (with a lag screw) the strap is given a 90° twist.

Sterility and Trace Minerals Not so many years ago there was a wide stretch in the southeast corner of Australia where a man could scarcely raise his hat. Grass wouldn't grow there and what few animals there were would not breed. Then somebody from Waite Institute, one of their better schools, found that the addition of copper, zinc, molybdenum, and phosphate to the soil turned the whole countryside in a blooming Eden. Last winter (summer down under) one of the best rams ever bred in Australia came from this district. The ram, a merino, was sold into New Zealand for $2,350.

Obit for Hazel In all the long history of cows, no cow ever produced more milk than Pansco Hazel, a registered Holstein owned by Frank Pellissier, of Whittier, Calif. THE FARM published a hymn of praise for Hazel a short time before she had her last calf, her 13th, on April 11, 1953. She was 18 years of age at the time and had produced 281,193 lbs. of milk and 10,599 lbs. of butterfat. Just before Christmas Hazel died — nothing particularly wrong with her—just tired perhaps.

Stop Thief! There's a gasoline thief on every farm and he works in broad daylight. In fact the brighter

CRAYDEN'S CHICKS

Backed by 29 Years' Breeding for extra vigor, fast growth, quick feathering, superior meat quality, high production ability — all the qualities that help in making extra profits

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At Crayden's you'll find the right breed for your purpose whether it be meat production or egg production. Nine popular breeds three crosses—sexed or straight run, give you a wide choice. Try Crayden's chicks and be convinced as so many successful growers have been. All breeders U. S. Approved -Pullorum Clean. Ducklings available, too. Illustrated literature tells the story—write for it.

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Purebred Hampshires for foundation stock. Open gilts $75; boars $100; weanling pigs $100 a pair, unrelated; includes Pedigree, transfer papers and weanling pigs. Real beauties for sale. 100% Bang tested herd. Double immune from cholera. If you want to improve your present herd, Ferndale has your animal. Count the hogs you see with a belt around 'em. Hamps breed well with any kind of healthy hog.

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Ferndale Farms, Cedarville, Ohio
Purebred Hamps available since 1915

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the light the better he works. If you use 2400 gallons of gas a year it is estimated that evaporation steals 8 gallons from your above-ground tank every month. It will even get its invisible siphon into your underground storage. To stop this thief, paint your above-ground tank white and build a shade over it.

Cool, Damp and Fatter Keep your fattening hogs cool. Recent California tests show that heavy hogs, over 160 pounds, do their best work—putting on weight—at a nice, comfortable temperature of 60 degrees. The lighter weights prefer it a bit warmer, 70 degrees. At a continual 100 degrees none of them can gain a pound. If a hog has a chance to wallow he'll gain better, too.

Otto Oerchel, one of Indiana's top hog raisers, beats the heat with portable steel shades. Each of these shades, 20′ x 20′ and supported by angleiron legs, is big enough to cool off 50 fat hogs. Oerchel says they cost him about $100 each, but he figures they pay for themselves in a week of hot weather.

Of Murders, Gaggles, and Prides In today's language, a farmer speaks of his flocks and herds and lets it go at that. Time was, however, when we had a special name for each gathering of our livestock. In the poultry yard it was a brood of chickens, a paddling of ducks, a gaggle of geese when they were on the water but a flock on land, a bevy of quail, a covey of partridges, and a muster of peacocks. Other birds had their own group names too. A mixture of them was called a flight, but it was a siege of herons or bitterns, a band of jays, a host of sparrows, a murder of crows, and a chattering of starlings.

In the animal world it was a drove of swine, a herd of cattle, a flock of sheep (a flock was also a hank of wool), a bury of rabbits, a skulk of foxes, and, if you happen to have any on the place, a crash of rhinoceroses. Insects come in swarms and fish in shoals or in schools. And, as every cross-word puzzler knows, whales, which are not fish, come in gams, and lions in prides.

THE DAIRY BARN

(*Continued from page* 16)

to his sister, Mrs. C. A. Stephan, whose son, Captain Lionel Stephan, sent us the picture. Captain Stephan tells us: "The local mail carrier tells us she will never make a good milk cow because the sun will shine in the back window and sour the milk. Her name is Toad, 'cause she ain't go no tail."

A New Milk Competitor As though oleomargerine (if you'll excuse the word) weren't giving dairymen enough of a headache with their butterfat, along comes a new concoction which is supposed to take the place of milk itself. As a matter of fact, there are two new milk substitutes, one made of deodorized fish flour and one of soybeans. The new milk substitutes are designed to improve the nutrition of children in countries where cows are scarce. The new fish flour, which can be used in place of milk in cooking, will be tried out in Chile. It is a tasteless, odorless product alleged to be rich in calcium and protein. Since it costs as much to produce as milk, it will be a long time before any North Americans will be getting fishshakes at the drug store or before mothers will be urging their children to "Drink your glass of fish flour, darling."

Antibiotics For Calves Calves make little or no extra growth when fed B_{12}, the vitamin which has become so important in poultry and pig feeds, but when fed an antibiotic the story is different. Dr. N. L. Jacobson, of Iowa State

CLAY NEW..PORTABLE CROP DRYER

JOS. B. CLAY

CLAY'S HAY DRYING COSTS 75¢ A TON
INCREASES FEED VALUE* OVER 100% . . makes your herd produce more milk from the same feed. It has been proven the cost for producing 100 lbs. of milk can be reduced from a high of $7.00 to a low of $3.50 with good roughage.

Jos. B. Clay, PRESIDENT CLAY EQUIP. CORP.

*Digestible protein content.

Take guesswork and worry out of haying. Stop damage and loss from rain and sun. *Mow hay at peak of protein content.* Put it in barn and dry it under controlled conditions. Conserve all that precious feed value. Cut feeding costs. Increase milk production. Do it year after year without exception.

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- CAN BE USED ON CORN AND OTHER GRAIN
- OPERATING COSTS AS LOW AS 75¢ PER TON
- NO FIRE HAZARD AS WITH HEATED AIR
- ONE MAN CAN MOVE DUCTS OUT OF WAY

INCREASE HAY TONNAGE
Handle hay when it can be raked and chopped without damage. Save all the leaves. Add up to 25% more tonnage per acre with Clay mow drying.

REDUCE FEEDING COSTS WITH HIGH PROTEIN CONTENT HAY
Tests show a good percentage of all cows kept for milk could produce the same quantity of butter fat on good high protein content legume hay and very little, if any, grain. Dairymen will bear this out and Clay dryer owners report up to $50.00 per month savings on feed bills from high protein content hay.

REDUCE FIRE HAZARDS
Eliminate danger of spontaneous combustion, particularly when using chopped hay. Protect your farm. Don't let wet hay cause you worry, cause your barn to burn.

Clay uses the natural-air open-duct system of drying. Permits maximum air flow from the fan through the hay. This method dries crop with minimum of equipment and maximum effectiveness. Can be engineered for any size or style barn. Ducts are built in sections for easy handling. Modernize your barn. Make your farm more productive. Write for

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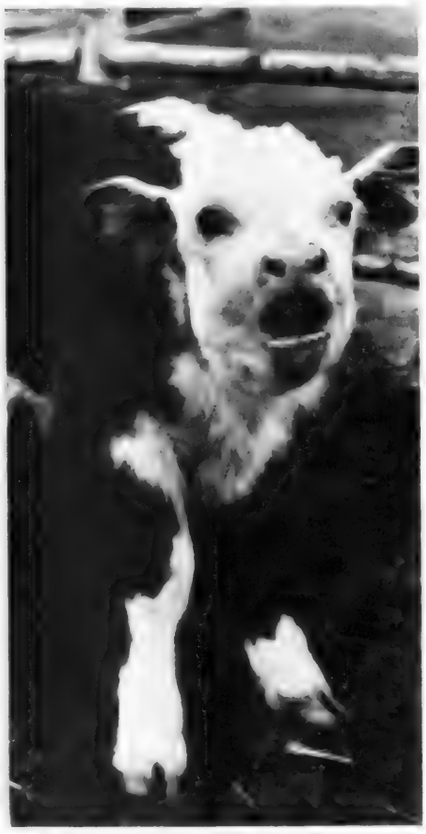
College, has been feeding aureomycin to dairy calves for several years now and has come to some cautious conclusions and raised a number of questions which he still wants answered.

When fed an antibiotic—Jacobson fed aureomycin at the rate of about a quarter of a gram a day, but others have had much the same result with terramycin—the calves' rate of growth was 10 to 30 per cent faster; they were brighter of eye,



sleeker of coat, had a better appetite, seemed to make a slightly more economical conversion of feed to flesh, and scoured less than the control calves which didn't get the antibiotics. Dr. Jacobson found that he could start feeding the antibiotics at four days or at several weeks and get a boost in growth rate: that when he stopped the antibiotic feeding the rate of growth gradually tapered off, but did not fall below the normal rate for the control calves. He continued the feeding of antibiotic supplement with some animals through their first lactation period, but found that the drug did not seem to affect reproduction or milk production. His rate of feeding ranged from 10 to 30 milligrams of antibiotic per 100 pounds of body weight.

As yet he is not sure that the more vigorous start of the antibiotic-fed calves will turn them into bigger or better cows or that the improved growth is worth the quarter of a cent extra in feed costs. Of one thing he is certain: that antibiotic feeding cannot be expected to replace good feeding and management practices.

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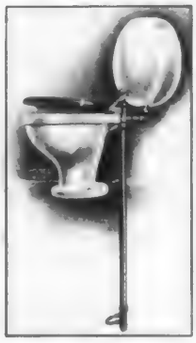
FROST-PROOF HYDRANT

- Will never freeze when properly installed.
- Provides complete fire protection by assuring running water even in coldest weather.
- Guarantees adequate water supply for live stock.
- Over a million Vogel Frost-Proof Valves have been sold.

The handle in this position shows at a glance that the water is positively shut off and is your guarantee against leakage and freezing.



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A real water saver. Vitreous china bowl is durable and easy to keep clean and will never freeze. No mechanism in tank to get out of order.

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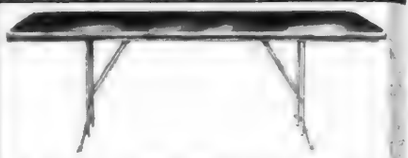

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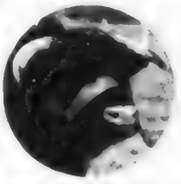
The Stomachs of a Calf When a calf is born, it it not a ruminant—that comes later. During the first two or three weeks, the calf must eat concentrated foods, like any other non-ruminant, and its four stomachs are arranged to take care of this kind of digestion. The rumen (the first stomach), reticulum (second stomach), and omasum (third stomach) represent only 30 per cent of the total stomach capacity; the abomasum (the fourth or true stomach) represents the remaining 70 per cent. As the calf grows, the rumen becomes larger in relation to the other stomachs and the abomasum shrinks. At the end of 2½ months the rumen has grown until it represents 70 per cent of the total stomach capacity and, when full growth of the animal is reached, the rumen represents 80 per cent of the total stomach capacity and may hold 40 to 50 gallons of liquid.

Soap for Bloat They're all excited at Madison, Wisconsin, over the possibilities of a new bloat remedy. Research there shows that a small amount of common household detergent can prevent bloat. Detergents seem to do the job by changing the type of bubbles produced by rumen digestion, allowing the frothy bubbles to form together more readily into larger bubbles that can be belched out. If the small bubbles are removed from the rumen liquid, the liquid has more buoyancy. But don't feed your cows soap just yet. The University of Wisconsin will check for safety.



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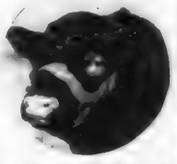

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Get bigger calves, better calves, healthier calves . . . the kind that carry the MOST beef and the BEST beef out of any feedlot.

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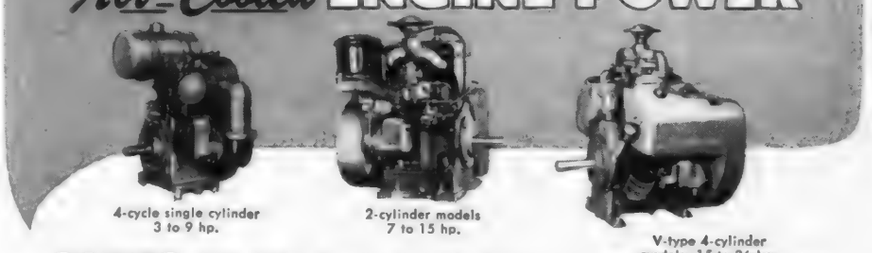

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Faced with high production costs and a tight market for farm products, your best solution of this problem is to transfer more of the work-load to efficiently mechanized equipment. This should be done on a basis that will let you lower your operating costs and, at the same time, increase the productive capacity of your land and labor. Wisconsin Engines can help you do this.

Note how this Single Cylinder Wisconsin Engine fits the Bolens Ridemaster Tractor.

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The farm equipment manufacturer can select exactly the right size Wisconsin Air-Cooled Engines to fit his machines, without power waste, because these engines come in a full range of sizes, from 3 to 36 hp., to fit almost any farm equipment you can mention. And because Wisconsin Engines are very compact and light in weight, they fit the machine without the need for costly re-designing of the equipment itself.

This Massey-Harris Pickup Baler shows how a Wisconsin Engine fits this important job.

POWER TO FIT THE JOB

No matter what kind of work your mechanized equipment is to do, or how tough it may be, a Wisconsin Air-Cooled Engine *fits the job.* Every Wisconsin Engine, from the smallest to the largest, is of heavy-duty design and construction all the way through. For example, the drop-forged crankshaft runs on tapered roller bearings at BOTH ends — your best protection against bearing failure and expensive layups.

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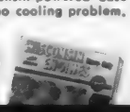

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CLOSED. For small grain, shelled corn, ground feed, small seed crops, finely chopped forage, etc.
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LEADERS IN BUILDING FAMOUS RODERICK LEAN • VULCAN • and HARVEY FARM IMPLEMENTS FOR NEARLY A CENTURY

COMING IN SUMMER

SOME PEOPLE say it's impossible today for a young man to start from scratch, without a rich uncle, and own his own farm. Here at THE FARM we doubted this, and in our Summer issue will publish a story about a group of young farmers who own, or are on their way to owning, their own farms—and they started from scratch. There will be a follow-up on our Spring irrigation story, "When to Irrigate," and survey articles on fire extinguishers and metal farm buildings. "Farm Bulk Milk Sales" will describe how a growing number of dairymen are taking the spread between what they get for milk and what the consumer pays. There will be stories on "High Protein Corn," "Diesel Tractors," "Blue Grass," "Growing and Fattening Beef Rations," "Tilth and Organic Matter in the Soil," "How to Get Pure Drinking Water From a Farm Pond," and "How to Make Sauerkraut." Among the feature stories with a timely interest will be "Are We Being Poisoned By Chemicals?" Neither snow nor rain nor gloom of night stays the rural mail carrier on his appointed rounds. The R. F. D. man is the hero of one of the major features in our Summer issue. A very unusual foreign feature has come our way, "How to Stuff a Goose," accompanied by two remarkable photographs.

LETTERS

(*Continued from page* 10)

Power Is Needed Down Under

Sirs:

I am a pastoralist, growing merino wool on a half million acre property in about the middle of the State of Western Australia. The place is marked on the map as a desert. However it is not quite a desert. We have about a 9" *average* rainfall, which can be as much as 23" or as little as 2". Also we have a good supply of good quality groundwater. This is used for growing alfalfa—lucerne to us—as a supplementary feed for sheep during drought. The altitude is about 1,800 ft., and there is plenty of sun, and heat. Fuel oil has to be transported 700 miles by rail and a further 105 miles by road—dirt road—and becomes a rather substantial item of cost in irrigation.

I have pioneered the work of growing lucerne and conserving same in this part of the country, and am satisfied that it pays. I am now experimenting with irrigated pasture, and to date the results have been encouraging. Costs have to be watched at all stages.

Could you give me any indication of what progress has been made in your country in the use of solar power, or wind power? I am quite familiar with small windmills—I have 46 of them—6 ft. to 14 ft.

J. Finch

Lorna Glen Station
Wiluna, Western Australia

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Charollaise Are Going Places

Sirs:

With reference to the article on Charollaise-Brahman crossbred cattle in your Winter issue, I wish to give you the following facts for what they are worth.

I was informed by Dr. J. K. Northway, who has been Chief Veterinarian for King Ranch for more than thirty years, that the King Ranch imported the first pure-bred Charollaise cattle to the United States. They imported two bulls, Neptune and Ortelan, who were full brothers from the famous Pugibet herd in Mexico. Pugibet was the Ambassador from France who imported the first Charollaise cattle to Mexico.

King Ranch bred these bulls to their top registered Braham cattle and I acquired 43 daughters from those bulls, which are part of my foundation herd. I have been breeding Charollaise-Brahman crossbred cattle now for about 10 years and at present have about 115 breeding females ranging from ½ Charollaise ½ Brahman up to full blood Charollaise cattle. This is the result of having bred five imported Pugibed bulls to some of the best registered Brahman cattle and to one full blood imported Charollaise cow.

For a concrete example which convinces me that Charollaise cattle are going places, I wish to give the following facts. I performed an experiment using two full blood Hereford steers along with a steer from a common range cow bred to a bull which was ½ Charollaise—½ Brahman: the other steer was from a cow that was ½ Hereford and ½ Brahman bred to a full blood Charollaise bull. These four steers were raised under range conditions until they were three and a half years old with no special attention whatsoever. I sent them to Port City Packing Company in Houston, Texas, to be sold by Cassidy Commission Company under regular market conditions.

The Hereford steers averaged 1,110 pounds and topped the market that day, bringing 25½ cents per ponud. The steer from the common cow bred to the Charollaise-Brahman bull weighed 1,320 pounds and brought only 23 cents per pound, but he carried 210 pounds more. Therefore he brought $20.00 more than the Herefords. The money maker, that is the steer from the Braford cow bred to the Charollaise bull, weighed 1,440 pounds and brought 25 cents per pound—$77.00 more than the Herefords.

The International Charollaise Cattle Raisers Association has just recently been organized, and I have been elected President of this Association. We are just getting started and now have members covering the territory including Mexico, Texas, Louisiana, Georgia, and Florida, and intend to cover the United States and foreign countries.

C. M. Frost

Esperson Building
Houston, Texas

How to Tilt A Jug

Sirs:

Anent the picture on page 42 of your Winter issue of the man drinking from the water jug, may I say that he knows nothing of the proper technique for holding said water jug. Anyone who has actually done farm work in the Summer time, whether it be haying, chopping cotton, or what have you, knows that the proper technique for holding a water jug to drink from is to put the index finger of the right hand in the ring of the handle, swing the jug up, letting it lie on top of the right arm in the region of the elbow, slowly raising it to your lips, thus allowing the cooling draught to flow gently into your mouth. The advantages of these methods are, a more complete control of the flow of the water and you only use one hand. Here in Texas we use no other method.

Otherwise it was a heck of a good magazine.

Wm. M. Bailey, M.D.

Tyler, Texas

The jug in question was wrapped in wet burlap to keep it cool which makes the one handed swig a messy operation. Anyway, Mormons are notoriously conservative drinkers.

Sirs:

I receive FARM QUARTERLY regularly and enjoy it very much.

I was particularly interested in the article "Cattle Without Cash" in the Winter '53 issue. I am also interested in receiving more information about grazing contracts.

Since 1945, farmers in the Grand Traverse area of northern Michigan have bought 300-400 pound calves in the west, had them shipped in, put them on good pasture for the summer, then sold them in the fall to be fattened in the Corn Belt area south of us. Of course, cattle are also available locally in the spring from individuals and companies who make a business of buying them in the west, hauling them in and offering them for sale.

I bought 40 head in 1951, which averaged 365 pounds off the car. We put them on good pasture for 150 days, and the average gain was 282 pounds on pasture alone. Of course, with the price drop in 1951 we didn't make any money; but since prices have stabilized somewhat, it does look better for '54.

What I am interested in is a sample contract for my particular type of setup. I believe, however, I would be better off handling larger cattle, say about 800 pounds, which would gain faster and I could sell them earlier, probably the latter part of August, for slaughter cattle.

Henry Doll

Cadillac, Michigan

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POWER-HO SUPER VERSA-MATIC MODEL 15 FD WITH BIG, POWERFUL 3.6 H.P. ENGINE

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One-lever Versa-Matic control, any desired forward speed or reverse, without shifting, clutching or belt changing. All at full engine governed speed with no loss of power. Reverse has safety action!

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Front wheel drive, turn-on-a-dime steering. 6 h.p. engine

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Controlled with a manually adjustable variable speed engine sheave.

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birds. the regular farm wiring system will probably do. If the total number of watts used by all of the lamps is under 1650, a 15-ampere circuit can be used. For larger installations a special circuit should be installed. If less than 100 chicks are to be raised, it would be well to use two of the 125-watt lamps which will save electricity and give protection should one of them fail. Either the hard or the soft glass bulbs may be used, but it is probably safer to pay the extra money for the hard bulbs. If a drop of water or a dropping from a chick should splash on the soft glass bulb when it is hot, it may break.

The lamp fixtures usually direct the rays from the lamp at an angle for greater coverage and to create a gradation of heat. The chick will move around in the zone it finds most comfortable. Some operators install thermostats with the lights to cut off some of the lamps when the coop temperature rises. As with any type brooding, it is important to keep the chicks out of drafts. A good tight house and a 15-inch cardboard fence around the brooding zone for the first ten days will help accomplish this.

Still another use for the heat lamps has been found by farmers who are using the conventional hovers for brooding. These poultrymen find that a couple of lamps out in the feeding area encourage the chicks to come out from under the hover and get on with the business at hand—eating and growing.

The major drawback with this type brooding is the danger of a power failure. If the power is off for any length of time the birds will certainly chill.

Sparrows and Newcastle The sparrows that clutter the eaves and rafters of the chicken coop with their nests and pilfer mash and grain from the feeders, may also be infecting the flock with Newcastle disease. Dr. D. P. Gustafson and Dr. H. E. Moses, of Purdue University, have definitely proved what was for some time suspected—that sparrows can be infected by Newcastle from sick chickens and that they, in turn, can infect chickens and other sparrows. It looks as though farmers will have to use a finer mesh screen on windows and ventilators to keep these pests from spreading the disease which is now costing us some 40 million dollars a year. It was just a hundred years ago that the Sparrow was introduced into this country to brighten up our lives.

YES SIR! It stands to reason...

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TWO blades cut better than ONE!

that's why LANTZ
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NEW MODEL "B" LANTZ COULTER
New engineering developments based on 15 years experience as coulter specialists, give the Model "B" (shown below) greater adaptability to plows with limited clearance, also to certain *left-hand or 2-way plows*. Model "B" 16" size recommended for Ford-Dearborn and Ferguson Plows. Disc blade crosses path of coulter blade to give rotary scissor action without binding. (See arrows in illustration below.)

*Dynamometer tests (recorded lbs. pull) prove that Lantz 2-Bladed Coulters pull no harder than other special coulters. They save costly friction and wear on furrowside of moldboard because they produce less side draft than other special coulters. The Kutter-Kolter can be used as a single-blade coulter where trash is no problem.

Write for free folders: Lantz Kutter-Kolter; Model "B" Coulter; Lantz Swinging Sickle Grinder.

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EXCLUSIVE FEED-SAVER FEATURE quickly pays for feeder
Full floating agitators distribute feed evenly to all 8 doors. Adjustable feed control regulates flow. Flared feeding pan eliminates waste. Made in 15, 30, 45 bu. cap. Easily moved on oak skids. Can't clog. 2 stage adjustment of feeding band. Weather and vermin-proof. Made of galvanized steel. Dealers, coast to coast.

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Melrose Park, Illinois

Cross-section of udder photographed shortly after ointment bases (with dyes added) were instilled.

For mastitis control—here's

PROOF YOU CAN SEE!

New exclusive ointment base carries medication right to the infection!

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penicillin • dihydrostreptomycin • bacitracin

- The photograph above shows how rapidly and completely TRIBIOTIC's new ointment base gets the medication into the udder tissues. An ordinary ointment base—instilled at the same time—appears in the lefthand section. Both bases were dyed before instillation for illustrative purposes. Note the great difference in spreading action.

- TRIBIOTIC contains 3 powerful antibiotics in effective proportions which kill more mastitis-causing organisms than does any single antibiotic. Remember, no *single* antibiotic has the power to control all types of germs causing mastitis.

TRIBIOTIC is easy to use. Handy single-dose, one-pinch tube is easy to insert—no threads to cause injury. Refrigeration not needed.

TRIBIOTIC is harmless to animals. Fast action gets cows back into production rapidly. Economical treatment because fewer tubes are needed.

SUPPLIED:
Single-dose tubes, each containing 100,000 units penicillin with the equivalent of 50 mg. dihydrostreptomycin base and 5000 units bacitracin.
NOW ONLY 89¢ per tube

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Lightning still starts three-eighths of all farm fire losses—more than twice as many as any other cause. Water piping and electric conduit, steel tracks and air ducts, all add extra hazard in modern buildings.

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protects lamps, motors, ranges, hot water heaters from surges induced by lightning. Prevents flashes induced in outlets, switches. No moving parts—nothing to wear or burn. Guaranteed five years; should last a lifetime. Get the full story now on both Security System and Green Guard.

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REPORT ON SNIDDELAAR

In Winter, 1951, THE FARM published a story about Farmer Wynand Meerveld, of Holland, his prodigious energy and thrift, his skill as a dairyman and farmer, and the unbelievable yields from his intensively farmed 33 acres. Every year we get a report from Farmer Meerveld, summarizing the activities of the year preceding, the yields from his fields and his herd, and his hopes for the future. Following is his report for 1953. Some of the yields seem high, but they have been checked by his county agent, and we must remember that Holland averages 65 bushels of wheat to the acre, and yields of 90 are not rare.—*The Editor.*

THE MEERVELD Family, with hired hands.

Report From Farm: "Sniddelaar Woundenberg." Owner: W. Meerveld.

Farm divided as follows:

17½ acres permanent grass (grazing land)
7½ acres artificial meadow (grazing land)
7½ acres cultivated land (crops)
1¼ acres orchard, garden, barn, farmhouse, etc., etc.

33¾ acres

Livestock:

20 Milking Cows
10 Heifers
14 Calves
2 Horses
1 Foal

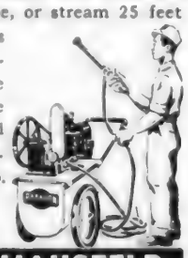
Labor:

Farmer Meerveld and wife
1 Maidservant (17 years old)
1 Head Laborer (28 years old)

On April 16th this year I took the cattle outside for day and night. The young cattle (heifers and calves) had been outside since 25th February and without the use of extra food besides grass, they did very well. In March this year I had approximate 5 acres converted into grass: 2½ acres to permanent meadow and 2½

easier with new PARAGON Power Sprayer

One man with this compact 12-gal. Paragon can *effectively* spray insecticides, disinfectants, weed killers, whitewash, water-based cement paints. Latest type spray gun produces mist for wide coverage, or stream 25 feet high. Pump delivers up to 1½ gals. a minute. Low priced. See your dealer or write for literature on hand and power sprayers.



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acres on high ground to artificial meadow with special grass mixture. I sowed this selection under cover of summer rye (approx. 220 lbs. per acre) not only for protection of the grass, but as protection against wind and erosion. For fertilizing I spread 10 cwt. basic slag ($CaHPO_4+CaO$), 4 cwt. potash 40% and 20 cub. yds. stable manure

MRS. MEERVELD with her white leghorns.

per 2½ acres. Then when sowing I used another 4 cwt. mixed lime, ammonia saltpeter ($CaCO_3+NH_4HO_3$).

On 20th May we harvested the above mentioned for silage. We were able to store 45 tons and mixed through this another 9 tons of mangles. On 10th June we harvested the hay from the same 5 acres and brought in 34/35 tons.

A lot for a little money!

TREMENDOUS VOLUME OF **20 Million** TREES A YEAR INSURES GREATEST VALUES . . .

Our huge operations growing millions of trees and shrubs yearly means we can offer some of America's outstanding values. Here are just a few (more in our free Catalog). All are POSTPAID.

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3 to 5 years healthy selected trees, 6" to 16" tall. 5 each of: Colorado Blue Spruce, Norway Spruce, Austrian Pine, Scotch Pine, Douglas Fir. Postpaid at planting time.

5 COLORADO BLUE SPRUCE $3.50

COLORADO BLUE. Very superior, well-branched 6-year-old transplants, 8 to 14 inches tall. Handsome specimens or hedge. Blue-green to marvelous blue color. Shipped Postpaid at planting time.

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This offer comprises 6 plants, 2 different varieties as follows:
4 HARDY AMERICAN HOLLY — these have extra green leaves, red berries (Pyramidal Treetype) 3 female plants, red berries; one male plant for pollen.
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LOW GROWING. Two year old seedlings that will make an ideal backward or garden fence; may be easily trimmed for formal type hedge. Red and white flowers 2½" to 3½" diameter, clusters of brick-red fruit in fall. Almost everblooming. 10 plants 10" to 18" tall shipped at planting time.

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All two-year transplants 3 to 8 inches tall, in individual planting bands, with abundant fine roots and large leaves. Both varieties hardy, prefer partial shade and acid soil. Rhododendrons in mixed colors — orchid, rose, red; Azaleas, 3 orange, 3 red. An outstanding value, will give you years of gorgeous flowers, add much beauty to your garden. All 12 plants packed for safe arrival, shipped at planting time, postpaid.

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This offer makes an ideal start on foundation planting at a minimum cost. All trees are branched, twice transplanted, distributed as follows:
5 JAPANESE YEW — upright, compact, cone-shaped with dense rich green foliage. Does well in sun or shade. 12" to 18" tall.
5 PFITZER JUNIPER, beautiful blue green foliage; a fast growing spreading type evergreen for sunny spots. 10" to 15" tall.
All 10 evergreens shipped at proper planting time

10 TREES $15.50 Postpaid

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SAVES 80% of your Labor!

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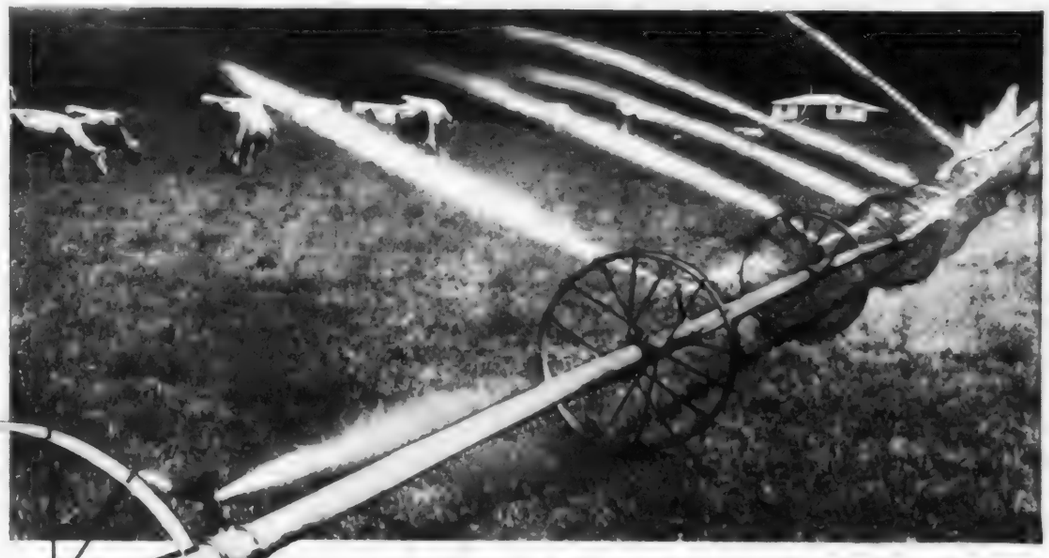

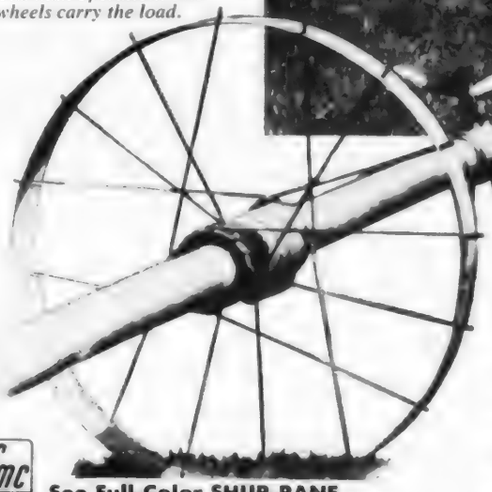

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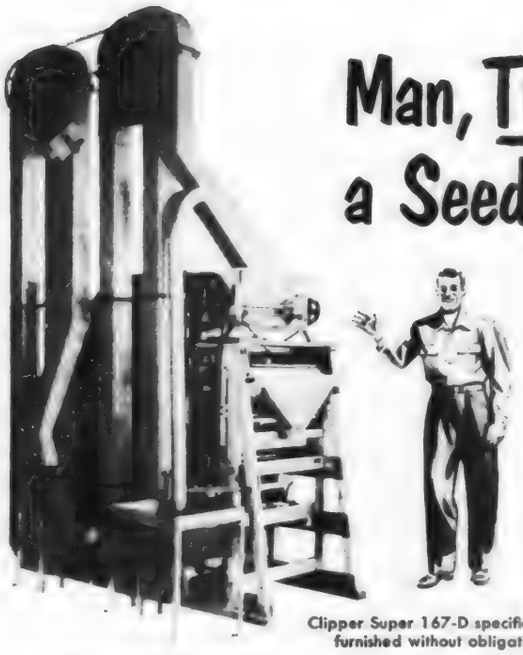
fmc TRADE MARK

See Full-Color SHUR-RANE Ad on Page 2



Man, There's a Seed Cleaner!

Because—
the Super 167-D fits so many requirements.

Ideal for the:

- Larger farmer
- Smaller seedsman
- Certified grower
- Custom plant operator
- Country elevatorman
- Large seedsman (as auxiliary machine)

Clipper Super 167-D specifications furnished without obligation.

The 167-D is a complete cleaning and elevating system . . . quickly and economically installed in any room having 13'1" clearance . . . easily operated . . . quick cleanouts . . . operates on any solid floor without pit (also available with 30" longer supply leg permitting sink hopper to set flush with the floor).
Cleans and grades nearly every variety of beans, grains and seeds grown anywhere.

There is a Clipper to do your job—over 60 models—capacities from 25 to 3500 bu. per hr.—write for your free catalog.

Clipper Cleaners — A Safe Investment

CLIPPER
GRAIN • SEED AND BEAN CLEANERS

A. T. FERRELL & CO. Dept. F Saginaw, Mich.

SAVE $11 to $16 a ton on feed with...

MIX YOUR OWN FEEDS

KELLY DUPLEX FEED MIXERS

Mix your own cattle, hog, poultry feeds. Get a perfect blend in 10 minutes, save 55c to 80c per 100 lbs. Rugged—easy to operate—absolutely noiseless.

It's just as easy and profitable to make your own poultry litter with a Kelly Duplex Cob Crusher—or to grind grain with a Kelly Duplex Hammermill. Satisfaction guaranteed or your money back. Mail coupon today for full details.

Vertical Mixers — all sizes—small as ½ ton

USE THE HANDY COUPON

Model M Hammermill

Corn Cob Crusher

CLIP COUPON AND MAIL TODAY!

The DUPLEX MILL & MFG. CO., Box 9, Springfield, Ohio

Send me full details on items checked.

☐ Feed Mixers____ton cap. ☐ Cob Crusher ☐ Hammermill

NAME_____

ADDRESS_____

After this came a period of cold, dry weather, and there was a slight shortage of fresh grass for the milking cows, and milk production was noticeably lower. This, however, was only temporary (about a week) as I had another 5 acres of new grass ready by that time.

In July I was able to store two more

STEAMED POTATOES keep all winter.

silos with green fodder (approx. 28 tons), this time mixed with molasses instead of mangles. I did not care to risk cutting any more grass after this as I had so many cattle to feed. This proved to be a wise action as the autumn months are so mild that many cattle are still outside; an exception for Holland where cattle are usually brought up by the second half of October. I have plenty of feeding stuff to see all the cattle through the winter, but will

FARMER MEERVELD'S registered Holsteins.

have to sell some cows next Spring. I feed the cattle roughly 4 cwt. of cattle-cake and other nourishing food per head per year.

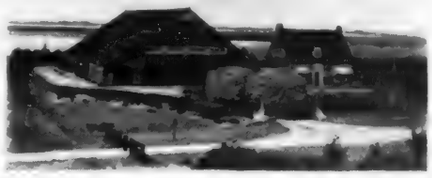
Last year, from 1/11/51 to 1/11/52, I delivered 22,500 gallons (a.m.) of milk to the milk factory; kept 850 gallons for the calves, etc., and used 430 gallons for house-

"IT COMES UP better this way."

hold consumption. The total—23,780 gallons—was yielded by 19 cows with an average fat yield of 3.63%. The approximate yield of these 19 cows last year was then 1250 gallons per head. I believe that this year's yield will be higher because at present the daily production is 68/70 gallons from 18 cows (2 are standing dry expecting to calf in December).

From the crops I had 2½ acres rye with a yield of 3.8 tons and 2½ acres of mixed oats and barley with a yield of 4 tons. After harvesting the rye I sowed turnips, which are growing well, and after the mixed barley and oats I converted the same 2½ acres into permanent meadow, which is now being grazed on for the second time by the 14 calves. They have been grazing on it now for more than 20 days and it still grows strongly, thanks to

the fertilizing mea[illegible] used when plowing the ground after harvesting the barley and oats. The fertilizing formula was as follows: 10 cwt. basic slag, 4 cwt. potash 40%, 3 cwt. lime, ammonia, saltpeter and 10 cubic yards of stable and pig manure per 2½ acres.



DUTCH farm layout is neat and compact.

The beet harvest was not very heavy (110 tons per 2½ acres). (I use the 2½ acres as a means of ground measurement as it is equal to 1 hectare, which is the common measure used in Holland.) The tops and leaves of the beets will be put into silo for winter fodder. I still have two silos from last year and the total provision for the winter is now roughly 135 cubic yards.

On my farm I also have 45 pigs and 400 hens of which 300 are White Leghorn and the rest a cross between Rhode Islands and partridge-colored; but I shall change back to having *all* White Leghorns as the cross-breeds are not laying so well as expected. Egg prices are also excellent as I get between 45 and 60 cents per dozen.

The profit from the pigs was not so good in the Spring but at the moment the meat prices are good (approximately 35 cents per 1 lb. slaughterweight), because grain prices have improved.

DRIVE POSTS

with PUSH-BUTTON EASE

Hammer down your fencing cost! Fence faster and easier ... save time and labor with the revolutionary Danuser Post Driver. Tractor-mounted, power driven, one-man operation. Single lever controls broad-faced 200 lb. driving weight. Delivers 25 blows per minute. Quickly drives steel or small wood posts. No splitting or "mushrooming" tops. Pivot adjustment for leveling on uneven ground. Tested and approved by tractor manufacturers. Also available as a trailer unit.

Write for literature pertaining to your model tractor, or specifications on TRAILER-MOUNTED DRIVER.

Manufactured by

DANUSER MACHINE CO.

508-09 East 3rd Street • Fulton, Missouri

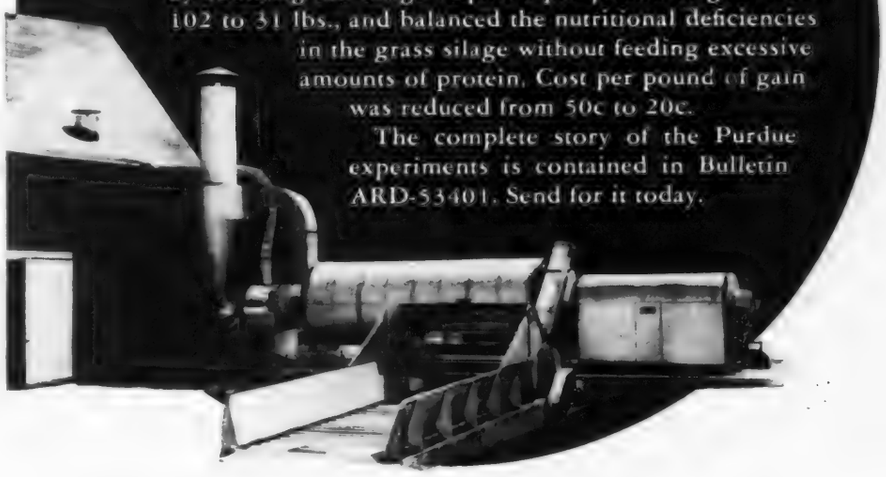
"Contributing to Farm Mechanization"

IMPROVE FEED EFFICIENCY AND GROWTH RATE OF YOUR STOCK...

ADD DEHYDRATED ALFALFA TO YOUR MIXED FEED AND GRASS SILAGE

PURDUE SCIENTISTS, after three years of research, have shown that dehydrated alfalfa meal contains factors which significantly improve the feed efficiency and growth rate of cattle. Test feeding experiments on steer calves proved that supplements containing dehydrated alfalfa top all others for daily gain, with lower cost per pound of gain. Adding a supplement containing dehydrated alfalfa to grass silage improved the over-all feed efficiency about 200% by reducing the silage required per pound of gain from 102 to 31 lbs., and balanced the nutritional deficiencies in the grass silage without feeding excessive amounts of protein. Cost per pound of gain was reduced from 50c to 20c.

The complete story of the Purdue experiments is contained in Bulletin ARD-53401. Send for it today.



ARDRIER DEHYDRATORS

fully preserve nutrition values of forage crops

Forage crops "flash dried" with an Ardrier Dehydrator are your best bet for wintering your stock at low cost with all the nutritional benefits of summer-green pasturage. Nature's own proteins, carotene and minerals are fully preserved to help you produce top grade beef, pork, poultry, milk and eggs *with an inexpensive, nutrition-rich feed you can process yourself* for higher profit.

Farmers report that their Ardrier Dehydrators pay for themselves in a short time. Send for literature showing how you can save on your feeding costs.

ARDRIER DEHYDRATORS are manufactured for ARNOLD DRYER COMPANY by THE HEIL CO.

ARNOLD DRYER COMPANY, DEPT. 4844 ARD-8
3048 W. Montana St., Milwaukee 1, Wis.

Gentlemen: Please send me Ardrier Dehydrator Bulletin No. ARD-51405

Name.....

Street or RFD.....

City.....

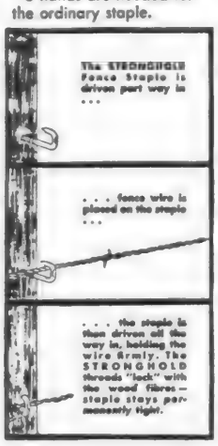
State.....

NEW!

only for Men with 2 Hands*

"Greatest Improvement in Fencing Since the Invention of Barbed Wire"

* 3 hands are needed for the ordinary staple.


THE STRONGHOLD Fence Staple is driven part way in . . .
. . . fence wire is placed on the staple . . .
. . . the staple is then driven all the way in, holding the wire firmly. The STRONGHOLD threads "lock" with the wood fibres — staple stays permanently tight.

WON'T "POP"
or loosen, even in creosoted posts. Stronghold threads "lock" with wood fibres—*gain holding power after driving.*

DRIVE FAST
Flattened head makes driving easy and fast. Staples go in straight.

Revolutionary new type Fence Staple saves time, labor, money. Enables one man to string barbed wire; eliminates costly maintenance due to staples that "pop," loosen, fall out. Famous STRONGHOLD scientifically engineered threads "lock" with wood fibres—actually *gain* in holding power month after month. Hold tight—*permanently tight*—in either native or creosoted posts.

Up to 50% more staples per pound

STRONGHOLD Fence Staples weigh less—you get up to 50% more staples per pound. And you save countless dollars on fence repair and maintenance!

SAMPLES FREE

We'll gladly send samples of STRONGHOLD Fence Staples and bulletin reporting tests by Dr. E. George Stern, Director Wood Research Laboratory, Virginia Polytechnic Institute. Please mention your dealer's name.

Made only by

INDEPENDENT NAIL
& PACKING CO.

The Stronghold Line

BRIDGEWATER, MASSACHUSETTS

WRITE US NOW!

FARM BOOKS

(*Continued from page* 90)

sonian doodle. The 177 pages of this farm book occupy the first part of the present volume. The second part is a compilation of Jefferson's writings on the agriculture of his time. Here, we are given his thoughts on slavery (which he loathed though he was a large slave holder), land preparation, farm buildings, animal husbandry, a discussion of the crops of his time and the introduction of new plants, crop rotation, and such miscellaneous matter as brewing, the production of nails on the farm, spinning, and the production of potash and pearlash.

With 177 pages of facsimile reproductions and a number of drawings and photographs, this book was of necessity an expensive publishing venture. To anyone interested in the amazing man who was Jefferson, however, the book is an extremely rewarding adventure. To a farmer, the book has a double fascination for in it are Jefferson's drawings and writings which were used to develop and improve the mold-board plow and his discoveries regarding the soil improvement made by clover in the rotation.

Tornadoes of the United States, by Snowden D. Flora, University of Oklahoma Press, Norman, Oklahoma, $3.50.

The greatest danger from tornadoes comes in May and June, most often in the afternoon between 4 and 7 p.m. The safest place to be, should one of these black, funnel-shaped storms come roaring toward you, is in a cyclone cellar, according to Snowden D. Flora, who retired as Senior Meteorologist for the U. S. Weather Bureau after 47 years of weather watching in Kansas. No one who has reached a cyclone celler and closed the door securely has ever been killed while in it, he writes in this interesting book. If you don't have a storm cave, the next safest place is the southwest corner of your basement—the crumbling house invariably falls to the northeast.

In this book, Mr. Flora not only gives the scientific background for tornadoes, how they form, travel, and operate, but there is also a wealth of personal experience enlivened by the frekish tricks which tornadoes sometimes perform. A whole chapter on the freaks of the storm tells of the man who was left untouched when the cow he was milking was blown away; and even the tall tales of the rooster blown into a bottle and the iron teakettle which was turned inside-out. In fact, by carefully labeling which stories have been authenticated and which are pure imagination, Mr. Flora has been able to tell most every fascinating story about tornadoes except for the Wizard of Oz which has been copyrighted.

Big Farm Production Ahead

The Danuser Digger is a time and labor saver, used in drilling holes for fence posts, foundations, seedling setting, transplanting, etc. Augers from 4" to 24" available. Thousands in use the world over. Write for literature pertaining to your model tractor.

DANUSER MACHINE CO.
505-09 E. Third St. Fulton, Mo.

DANUSER DIGGER

COUGHS DUE TO COLDS

among horses, mules, cattle, sheep and dogs call for treatment with SPOHN'S COMPOUND. A stimulating expectorant. Acts on throat and bronchial tubes to hasten relief. Used by world-famous horsemen for 55 years. At drug stores, or direct, postage paid, 75c and $1.50.

SPOHN MEDICAL CO., BOX 14, GOSHEN, IND.

SPOHN'S COMPOUND
FOR COUGHS DUE TO COLDS

DEALERS INVITED TO WRITE FOR INFORMATION ON AVAILABLE TERRITORIES.

ESHELMAN FOR Better LAWNS And GARDENS

RAKES PLOWS CULTIVATES HARROWS HAULS SPRAYS SAWS DOZES MOWS CUTS ROLLS TILLS SNOW PLOWS

Also walking tractors as low as $69

1 to 8 H. P.
Women Can Operate It.
Low operating cost.
Built for powerful and dependable service.
Write Eshelman for free catalog.

For BETTER GARDENS ESHELMAN ROTARY TILLER

ONLY $99.95

Turns virgin ground into a garden bed in one operation. Replaces plowing, discing, and cultivating. Women can operate it. Also 1 to 8 H.P. POWER MOWERS AND RIDING TRACTORS from $69. Free Catalog. Write:

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119 Light St., Baltimore 2, Md.
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2 H.P.

Raise TURKEYS THE NEW WAY!

Write for free information explaining how to make up to $3,000 in your own backyard. *Address:*

NATIONAL TURKEY INSTITUTE
Dept. 145 Columbus, Kansas

Not the least interesting part of the book is a chapter on how to identify a tornado in time to tie down the family cow and duck into the "scare hole".

***Our Garden Soils**, by Charles E. Kellogg. The Macmillan Company, New York. $4.00.*

Dr. Kellogg, Chief of the Division of Soil Survey, USDA, sets out to unravel the complexities of soil science for the average gardener. In non-technical terms he explains how to tell what kind of soil you have and what plants will grow best on it. Included are simple explanations of compost and other organic materials in relation to chemical fertilizers and why the good gardener uses both. Individual plant nutrients, and how to balance them, are discussed.

LIFETIME FENCES

(*Continued from page* 68)

cate (1) the number of line (horizontal) wires, (2) the height of the fence in inches, (3) the spacing in inches between the stays (vertical) wires, and (4) the gauge of the wires other than the top and bottom line wires. Thus, style No. 1047-6-11 indicates that this style of fence has 10 line wires, is 47 inches high with stay wires spaced 6 inches apart, and is made of No. 11 gauge wire.

Field fence comes in 20 rod rolls (330 feet) and if you ask a dealer to cut a roll he will charge additional per rod, for no one likes to splice fencing and his remnant will have to be sold as such.

The 26 and 32-inch high fence is known as "hog fence." It can be used for fencing any kind of livestock by adding barb wires at the top. The first barbed wire should be 3 inches above the mesh, the next ones should be 6 and 8 inches apart. The closer the stays and the heavier the wire gauge the longer the fence will last. The 26 and

A GOOD man with a steel post driver, like Alvin Anderson of Carrol County, Ind., below, can put a steel post 3 ft. in the ground in a little over a minute.

Mister, You Are So Right! You've Got The Best Elevator Value Money Can Buy When You Own a . . .

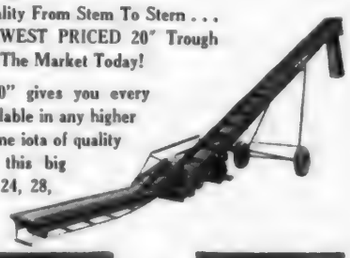
CARDINAL

"Skipper 20"

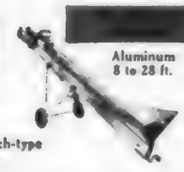
WITH BIG 20" TROUGH

It's Top Quality From Stem To Stern . . . and the LOWEST PRICED 20" Trough Elevator On The Market Today!

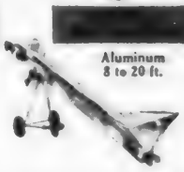
Cardinal "Skipper 20" gives you every operating feature available in any higher priced elevator. Not one iota of quality has been sacrificed to bring you this big money-saving value. Trough lengths—24, 28, 32, 36, 40 and 44 feet.



TOP VALUES IN THE CARDINAL JUNIOR LINE, TOO!



Aluminum 8 to 28 ft.



Aluminum 8 to 20 ft.

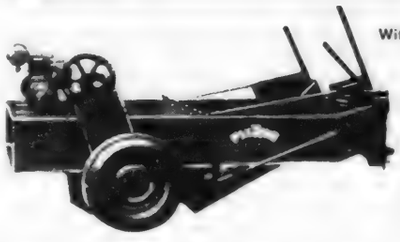
Galvanized 12 to 28 ft.

Choice of dolly or winch-type chassis; fits all models.

SEE YOUR CARDINAL DEALER OR WRITE FOR FREE LITERATURE

LML ENGINEERING & MFG. CORP. 621 S. Chauncey Street COLUMBIA CITY, INDIANA

PLAGUED WITH STONY FIELDS ?



With **PIXTONE** THE *New* MECHANICAL STONEPICKER

No longer do you need to put up with costly damage to implements, decreased operating efficiency, and smaller yields due to stone-choked fields. You can easily and quickly remove stones mechanically with the new PIXTONE and any 2-plow tractor. PIXTONE clears up to 4 acres a day—picks up, carries, dumps up to 50 tons of stone (1½" to 8" diameter) in an 8-hour day. Leaves a perfect stone-free seed bed. Saves labor, implement wear and breakage, increases soil productivity. Also excellent for clearing stones from pasture land. Thoroughly tested during past five years—hundreds in use.

Your local implement dealer can no doubt arrange a demonstration of PIXTONE, without obligation. Send coupon for full information by mail.

MAIL COUPON TODAY

Bridgeport Implement Works, Inc. Dept. D
1483 Stratford Ave., Stratford, Conn.
Please rush free literature regarding PIXTONE.
My implement dealer is
☐ Students check here for special literature.
NAME .....
ROAD or STREET ..... R.D. No. .....
CITY ..... STATE .....

BRIDGEPORT IMPLEMENT WORKS, Inc., Stratford, Conn.

clean, easy-to-handle PENTA-TREATED POSTS *last a lot longer*

Fencing is hard work and early replacements cost you time and money—buy PENTA-treated posts and they'll stand up through many more years of service

THE DOW CHEMICAL COMPANY
Dept. PE 761M, Midland, Michigan
Please send free of cost the following information:

- ☐ Booklet, "Before You Build Your Barn".
- ☐ Tell me where to buy clean PENTA-treated poles.
- ☐ Tell me where to buy clean PENTA-treated posts.

Name_____

Rural Route No._____

Town_____ State_____

You build stability, strength and long life into your fence when you use PENTA*-treated wood posts. This is true because PENTA resists termites and decay . . . above ground, below ground, wherever the danger to wood exists. The *clean* treatment that PENTA gives to wood makes it easy and pleasant to handle—better for stock, too.

Protect the money you're investing in fencing, pole barns and other buildings—with *PENTA-chlorophenol, call it PENTA for short. Ask for it when you buy pressure-treated posts or poles. If you cut your own posts, treat them yourself—buy PENTA by the can. For more information on PENTA, mail the coupon. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW CHEMICALS DOW

32-inch woven fences are often used for movable fence. For this use the lighter gauge fence is the better buy.

Stepping up into 39, 47 and 55-inch stock fence, we again find there is a choice of wire and stay spacing, varying from 9 line wires in the 39-inch fence, 10 wires in the 47-inch fence, to 11 wires in the 55-inch fence. The height again is determined by local preference and the amount of money to be spent on wire. For heavy duty, No. 9 wire 47-inch fence with a strand of barbed wire topping it is one of the most used Midwest combinations.

A wider-spaced mesh known as "Sheep, Horse and Cattle Fence" comes in 35, 45

STUMP FENCES are popular with farmers in Michigan. It isn't that they like them so well, but they have to put the stumps somewhere.

and 49-inch heights. The 12-inch stay spacing prevents the sheep from hanging themselves in reaching through the fence. They can always get their heads out.

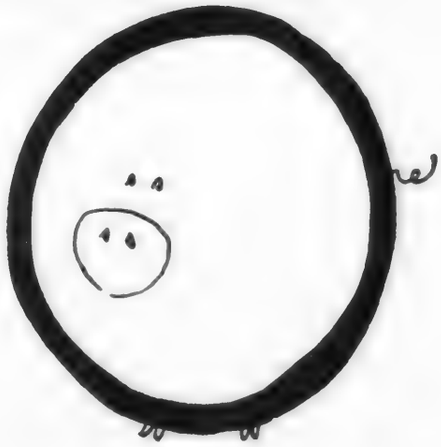
Poultry fencing comes in lighter gauges, 13 to 17 gauge, and heights from 35 to 72 inches. If livestock are to be kept in a field on the other side of the chicken yard the heavier gauge fence should be used.

Barbed Wire Fencing

On the big Texas ranches where there are often hundreds of miles of fence to maintain, woven fence is almost unknown. The half-million acre Waggoner DDD Ranch has 2,300 miles of 3-strand barb wire fence. The Pitchfork Ranch hires a band of Navajo Indians to put up 5-strand barbed wire fence on cedar posts. Once a year they come and brighten the landscape with their gaudy shirts. As fence builders, a look down a mile-long stretch will convince anyone they are tops.

Three-wire fence is usually stretched with the lower strand 12 inches from the ground and the two upper strands each 12 inches apart. If four or more strands of

KENTUCKY style stock fences are a study in black and white. The shiny black braces are wired tight to each bright line wire. Treated posts are nearly always used.



"I want to see a coupon big enough for a hog to step on!"

—says a FARM QUARTERLY reader

To FARM QUARTERLY
22 East 12th Street
Cincinnati 10, Ohio

Enter my one year subscription to Farm Quarterly for which I enclose $2.00 : :

2 Years . . . . $3.50 **3 Years $5.00**

NAME .....

ADDRESS .....

TOWN ..... RFD ..... BOX ..... STATE .....

ROTO-HOE
GARDEN TOOLS

America's Most Usable Garden Tool!

TILLS — CULTIVATES — COMPOSTS

Tens of thousands of users find ROTO-HOE ideal for year 'round jobs. A big machine at modest cost, thoroughly engineered and field proven for over 7 years! It will pay you to investigate.

YEAR 'ROUND ATTACHMENTS
use same basic power unit!

20" ROTO-CUTTER, only $34.50
12" TRIMMER-MULCHER, only $24
16" ROTO-SNO BLOWER, only $38
5 gal. ROTO-ZEPHYR SPRAYER, only $77
Adapta-Cart, for mounting compressor, generator, other tools for easy portability, only $11.50

Ask your dealer for a demonstration; or write us today for informative illustrated full color catalog and name of nearest dealer.
(A few dealer franchises are still available.)

ROTO-HOE & SPRAYER COMPANY
Box 7 Newbury, Ohio

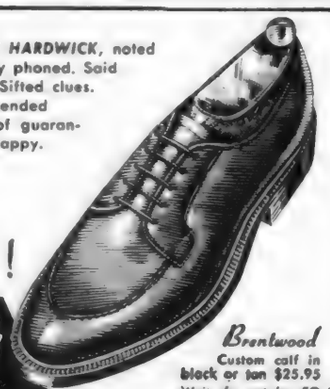
for BIG REWARDS from inoculation
use N-I-T-R-A-G-I-N

★ Helps legumes get nitrogen from air
★ Helps boost both yield and quality
★ Soil benefits may be seen for years
★ Helps improve future crops, pastures
★ Costs about 10¢, 2 minutes per acre
★ Get fresh, dated NITRAGIN in the orange-colored can from your seedsman

THE NITRAGIN CO., Inc., 3267 W. Custer Ave., Milwaukee 9, Wis.

HARD-HEADED HARRY HARDWICK, noted private eye, says: "Guy phoned. Said feet were killing him. Sifted clues. Sifted shoes. Recommended Allen-Edmonds shoes of guaranteed comfort. Client happy. Case closed."

Comfort Guaranteed in writing!



Allen-Edmonds
BELGIUM, WISCONSIN

Brentwood
Custom calf in black or tan $25.95
Write for catalog FQ-1

wire are used, the lower one is 12 inches from the ground and the upper strands are 8 or 10 inches apart.

If hogs are in the picture you had better forget the barb wire fence and put in woven fence. It's a good idea to use a strand of barb wire underneath the woven fence, though: this will discourage rooting.

What Does It Cost?

Fence costs will vary widely with labor, wire and post costs and with the kind of soil you have to dig in to set the posts. To come down to a specific fence-building operation we can look in on the Arthur Gray farm in southern Indiana. The farm is rolling, sometimes hilly, but the post hole digger rarely strikes rocks in sinking line post holes. The posts are locust and are cut on the farm. They are peeled while they are green. Here's how the costs ran this spring:

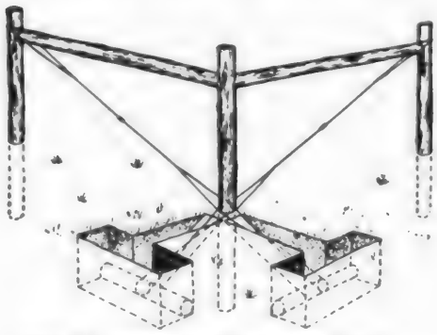
Cost per Rod of Line Fencing

Post (set 1 rod apart, cost figure includes cutting, peeling hauling to field)	$ .50
Wire (47-inch, all No. 9 wire mesh)	1.75
Labor (2 men can set 15 rods of line fence a day)	1.20
Staples	.10
Tractor use (gasoline, etc.)	.25
	$3.80

On the Gray farm the corner posts are 9-foot locusts, not less than 8 inches in diameter. They are set 4 feet deep, double braced and wired. On a good day, the two men can put up two of them, brace them and tamp them in. They figure a corner post and braces and setting costs in the neighborhood of $12.00.

Fence Contractors

In every farm area there is always a fence expert: he is usually a handy man to have around at butchering time and he can tell you how to frame a new barn to carry the hay load. He takes fencing jobs as sort of a senior consulting engineer. He stretches the line and keeps the farmer and his boys busy with the heavy work. There are a few of these old-timers left, but they are being replaced by a new breed of fence-builders. These men are contractors and can supply everything that is needed to build a fence, or they will



THIS IS a single-braced corner post with deadmen. If the deadmen are buried deep and are husky posts 3 ft. long by 5 in. diameter this corner is almost as serviceable as a double-braced corner.

upply the labor and tools and machinery and let the farmer supply the wire and posts. They take the contract by the mile or by the rod and when they move in the fence gets built fast, for they have power-operated saws, tractor post hole diggers or post drivers, and they have a crew of men who know fencing because they live with it every day.

One Indiana fence contractor, Adrian Day of Chalmers, Indiana, charges $1.75 a rod for line fence building—the owner supplying all of the materials. Spence Roberts, Jr. of Paris, Kentucky contracts for fence construction on any one of several plans. Roberts specializes in Kentucky stock fence, using 5-inch line posts and 14-inch corner posts. The fence is woven No. 9 wire with 8 line wires and stays spaced 12 inches apart. Every other line post is a metal post and all the line posts are set a rod apart. In between each line post he wires on 2 braces that extend from the ground to the top of the barbed wire. These are oak, 2 by 2 inches and creosoted. Roberts says of these braces: "They give the fence an overall stiffness and we don't need to give the fence as much stretch. A fence built this way will have spring and life in it . . . and it will last longer.

"Most of the fences I build are for people who like to buy their own fence wire, but I often have to round up the posts for them. I supply all the labor, tools, machinery and help and build the fence for $1.50

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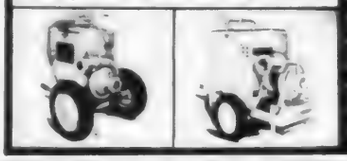

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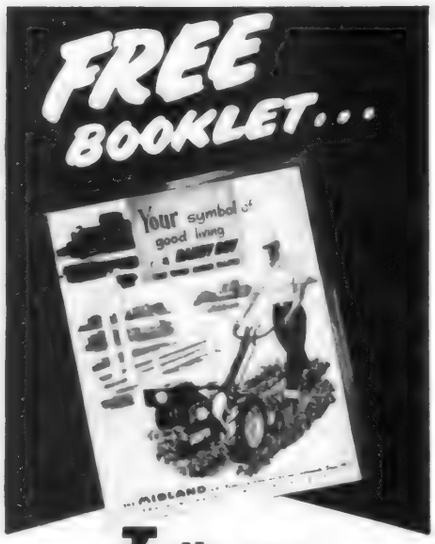

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a rod. On that basis the fence will figure out about like this on a per rod basis:

Owner Supplies:	
Line posts (treated)	$1.35
No. 9 wire 47-inch fencing	1.49
Barbed wire (4 point)	.08
	$2.92

Roberts Supplies:	
Construction labor	$1.50
2 braces	.24
Creosoting braces	.10
Slat wires	.10
Staples	.10
	$2.04

Total fence cost, $4.96 a rod

"Every other rod when I use a steel post the cost is 40 cents less.

"We've got lots of stone here in this part of Kentucky," says Roberts, "and we have to use an air hammer most of the time when we dig our corner post holes. We carry a compressor on a truck. We have two tractors, each equipped with a post hole digger. For setting a corner post we charge $3.00; if we supply the post we get $5.00 for it. With a four-man crew we can build 45 rods of fence a day. Last year we built well over 12 miles of fence and this year it looks like we will build even more. We work in fencing with raising 18 acres of Burley tobacco. It makes a good combination."

On any farm good fences are a pleasure

THIS inexpensive fence-splicing tool saves the wear and tear on the fingers and is faster to use than pliers. It catches the loose wire and makes a neat splice at an end post or when joining two rolls of wire. The splicer will work with any gauge wire.

to look at and to work with and on a stock farm they are a necessity—to avoid breeding mistakes. If we look backward, a little over 100 years ago, we can see the classic example of a mistake that happened to turn out all right—that might never have occurred with fences as we build them today. It was in Wales in 1844 that the bull "Chance" broke out of his pen. On February 13, 1845 his daughter gave birth to "Sir David 68." He turned out to be one of the great Hereford show bulls of all times. As one Hereford breeder said, "Thank God for those brittle boards!"

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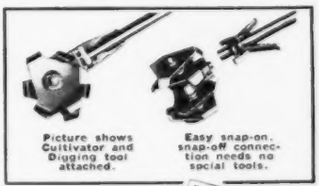

Picture shows Cultivator and Digging tool attached.

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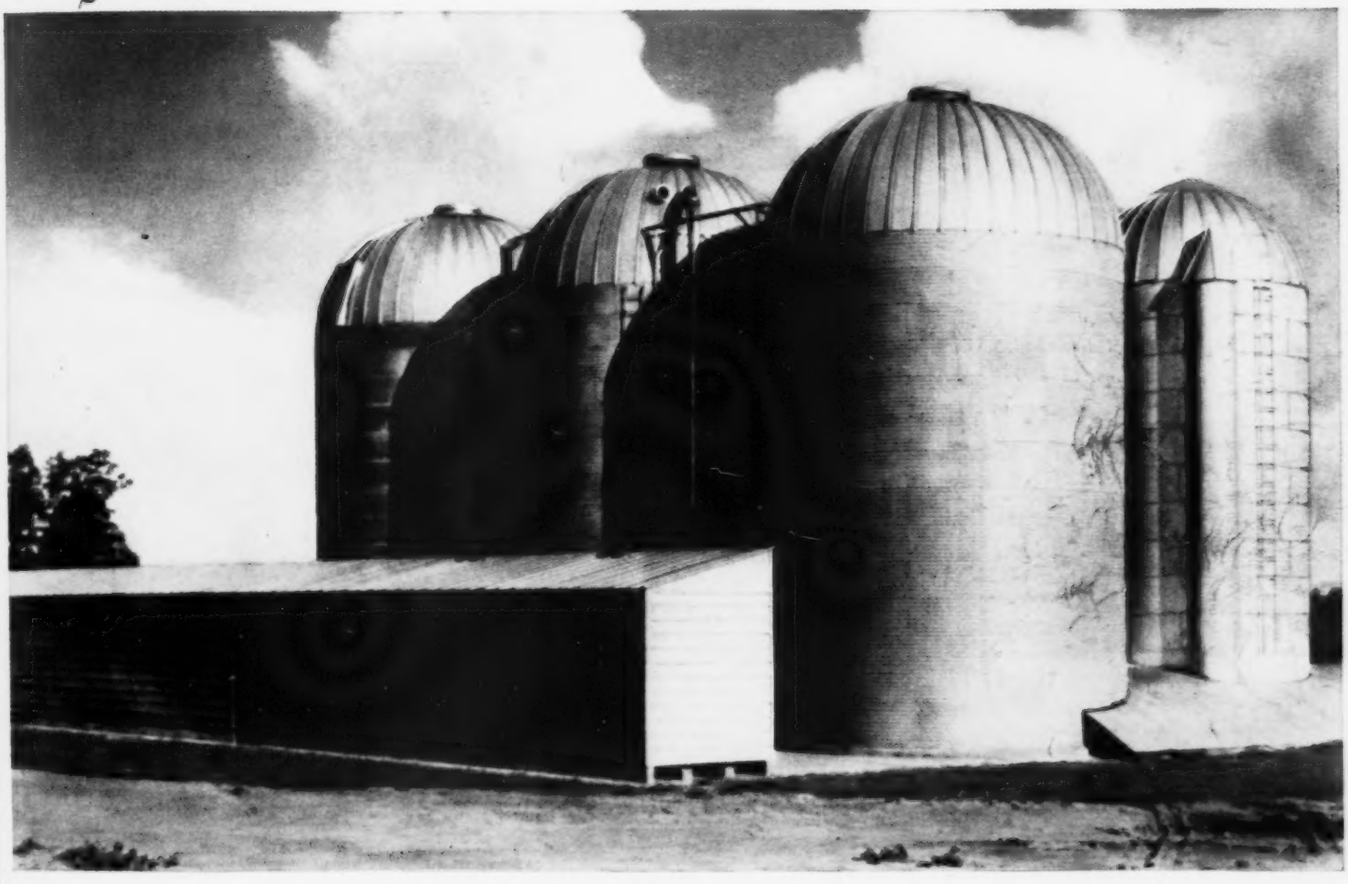

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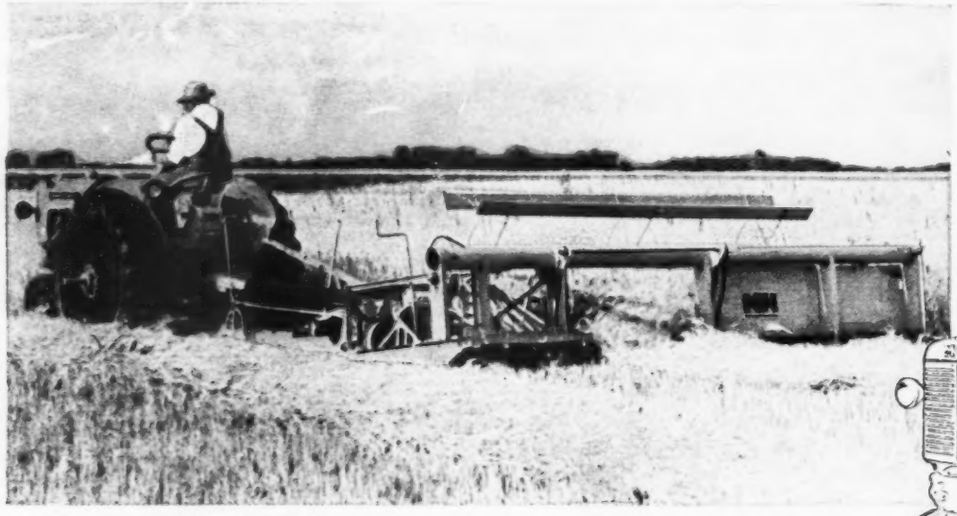


MINNEAPOLIS-MOLINE

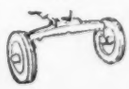
ZB

Zip through field work when every hour means extra money in your pocket. You handle bigger-than-2-plow jobs with new speed and ease when you drive the powerful new Model ZB. Balanced weight to power gives you firm, sure traction . . . full 3-plow lugging on any ground. Live power take-off (optional on both ZB and UB tractors) lets you slow up or stop the tractor, and still keep your windrower, corn picker, forage harvestor or combine running at a constant speed.

3 front end types to fit your farm . . . your crops!

TYPE U
Dual front wheels

TYPE N
Single front wheel



TYPE E
Wide adjustable front wheels

Ask your MM dealer to show you right on your own farm, how much *more* these new MM tractors can do!

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINN.

MINNEAPOLIS MOLINE
MODERN MACHINERY